REFLECTIONS

FOR

EVERY DAY IN THE YEAR,

ON THE

WORKS OF GOD,

IN

NATURE & PROVIDENCE.

FROM THE GERMAN OF

CHRISTOPHER CHRISTIAN STURM.

A NEW EDITION IN TWO VOLUMES,

EMBELLISHED WITH

TWELVE BEAUTIFUL ENGRAVINGS,

EMBLEMATICAL OF THE TWELVE MONTHS.

VOL. I.

The works of the Lord are great, sought out of all them that have "pleasure therein." Psalm cxi. v. 2.

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REFLECTIONS, &c.

JANUARY 1.

Reflections on New-year's Day.

I VIEW this day of the year, as if it were the first day of my existence? and I humbly hope, through the divine goodness, blessings shall be granted to me for this year, equal to those I have enjoyed from my birth till now. What may I not expect from that God, who from the first moment of my life, nay, even before I was born, provided for me with such infinite tenderness? He gave me friends in my parents, who supported and brought me up from my very birth, and whose disinterested love protected me in that helpless state. How could I have been preserved without such care, to enjoy that variety of blessings, which I now possess?

Had I, at that time, been capable of reflection, no doubt I might have promised myself many agreeable hours, in the course of my existence on earth. Since I am now endowed with that power, I will give myself up entirely to a sense of my

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happiness, and the future hopes I am permitted to indulge. I this day enter on a new period of my life, not so much unprovided for, nor so helpless, as when I first came into the world, but am still as necessitous in many respects. I still want friends to shed sweets upon my life, to support my spirits when oppressed with grief, and to admonish me of dangers I might otherwise fall into. And, surely, my gracious God will grant me this best of blessings! Whatever may happen to me in the course of this year, he has undoubtedly chosen me some kind friend, to be my adviser in difficulties, and to comfort me under misfortunes; one who will share the sweets of prosperity with me, and, in moments of weakness, will aid and support my reason.

The all-wise God has laid the foundation of my future lot from the first moment of my life. My being born of such parents, in such a place, and at such a time is not by chance. The time, the place, the circumstances, and even the consequences of my birth, were all planned by infinite wisdom. It was from the first, that God fixed my fate, weighed the evils I was to endure, and saw the pleasures and comforts, which were to restore calm and serenity to my mind. A variety of causes, then unknown, were by his decree, to combine for my happiness; and all things relating to me, were intented to accomplish his beneficent views. The Lord this day settles, as it were, my lot over again. He who gave me being takes in at one perfect glance, each week, each day, each moment of this year. Though all which relates to me, is

hidden from me, yet all things are visible to God, and are settled according to his decrees, which are full of wisdom and goodness. Should I in the course of this year experience any misfortune, which I cannot foresee; should any unforeseen happiness fall to my lot; should I sustain any unexpected loss; all will happen according to the will of God. Filled with this conviction, I begin the new year. Whatever may occur, I shall be more and more persuaded, that God will be my preserver, in my old age, as he was in my youth. Should I be exposed to poverty and distress, I will recollect the still more critical state of my infancy, in which he protected me. The ingratitude of a friend ought not to render me unhappy. God can soon raise me up other friends, in whose tenderness I may enjoy unexpected comfort and delight. Even danger and persecution, beyond all human foresight, ought not to terrify me. Though my life should be full of them, let me confide in God who protected me in childhood, when exposed to a thousand dangers. Why then, should I not begin this year with a tranquil mind? I would look forward without anxiety, and leave my fate to the guidance of an unerring Providence.

JAN. 2.

The blessings granted us in Winter.

WERE we to examine the glorious works of God more attentively than we generally do, we should find, even at this season, many reasons to rejoice in

his superabundant goodness, and to praise the wonders of his wisdom. When beauteous nature displays the rich blessings of God in spring, summer, and autumn, few are so insensible as not to feel some emotions of pleasure and gratitude. But the sensations of gratitude are rarely excited even in sensible minds when they behold the trees stripped of their fruit, and the fields without verdure; when the cold winds whistle round their dwellings, and a chilling cold freezes the earth and benumbs its inhabitants. But is it really true that this season is so totally deprived of the blessings of God, and of what ought to kindle piety and gratitude in the heart of man? Certainly not. Let us only be more attentive to the works of God, more sensibly touched with the many proofs of his goodness towards us, and we shall find sufficient reason to praise our adorable Benefactor, even in winter. What would be our situation, during violent cold, if we had neither fuel nor clothes to keep us warm! With what tender goodness the Lord prevents our wants, and supplies us even during winter's cold with the necessaries and comforts of life! While, at this moment, we may be enjoying the comfortable warmth of a fire, shall we not lift up our hearts in grateful praise to that God, who gives us these supplies?

Were it given to mortals to know the chain of every thing in nature, how astonishing would be our admiration at the wisdom and goodness of its *Author!* But though we cannot form an adequate idea of all his works, the little we do know of them, must constrain us to acknowledge, that the govern-

ment of God is infinitely wise and beneficent. Winter is included in the noble plan he has formed. If this season did not exist, the spring and summer would lose many of their charms, the fertility of the fields would diminish, commerce would cease in many provinces, and part of the woods and forests would have been created in vain. Viewed in this light, winter is certainly very useful, and though its advantages were not so apparent, it should suffice us to reflect, that winter is the work of the Creator as well as the other seasons, and that all which comes from God must be for the best.

JAN. 3.

The daily proofs of God's providence.

NOT to acknowledge the hand of Divine Providence, except in some extraordinary cases, is certainly to betray our ignorance and weakness. In the ordinary course of nature, things are daily offering themselves, which ought to excite our attention and admiration. The astonishing formation of a child in the womb of its mother, is as great a miracle of the wisdom and power of God, as the creation of the first man out of the dust of the earth. The preservation also of our life, if we properly consider the various causes and effects which combine for that purpose, is no less astonishing, than the resurrection of the dead. The sole difference lies here; the one happens but seldom, while we every day witness the other. And this is the only reason why it does not strike us more

sensibly, or raise our admiration, as it otherwise would do. My own experience, no doubt, ought fully to convince me, that a Divine Providence watches over the preservation of my days. I can not be certain of a single moment of my life; a thousand unknown and secret causes, may soon terminate it, chill my blood, and stop my breath! Alas! I feel but too well, my own inability, to preserve my life, or to remove the infirmities and dangers with which I am threatened. Subject to such variety of bodily evils, to so many wants, I am thoroughly convinced, that were it not for the tender mercies of God, I should be a very wretched being indeed! The union of my soul and body, and their continual and reciprocal acting on each other, are incomprehensible, and neither depend on my will or power. The circulation of fluids within me, the beating of my pulse, go on without interruption, though I am not able to contribute to them in the smallest degree. All things convince me, that neither my taste, my faculties, nor the duration of my life, depend on my own will. It is the Almighty, who by a secret and absolute power, maintains in me motion, strength, and life. If my breath is not stopped, if my blood still flows, if my limbs possess their activity, if the organs of my senses preserve their play; and if, at this moment I have the faculty of thinking and the use of reason, it is to God alone that I am indebted for these blessings.

But why do I so seldom reflect, and with so little gratitude, on the daily manifestations of Providence? Ought not the reflections which have just

offered themselves, to have been always imprinted on my heart? Should I not at least every morning and evening of my life, meditate on the great benefits of my Creator? And ought I not to admire, adore, and bless him for the same? Most certainly I ought. By this constant religious homage I ought to distinguish myself from the insensible brute creation, who have not received the faculty of contemplating the works of God.

O thou divine Preserver of my life! teach me properly to contemplate the miracles of thy goodness! And when thou grantest me a favour, however small in itself, may I feel the value of it; let it lead me to glorify thy name, and to acknowledge that thou art the only source of my happiness! Then may I apply to myself the words of the holy patriarch, "I am not worthy of the least of all thy mercies "and of all the truth which thou hast shewed to thy "servant." GEN. xxxii. 10.

JAN. 4.

The several uses of Fire.

FIRE, in some degree, is the universal instrument of all the arts, and all the necessaries of life. This element is incorporated with the air, the water, and all fat and oily substances, that man might make continual use of it. How very useful for fuel is all combustible matter! Without a sufficient quantity of it we should at once lose the greatest advantages, and be exposed to the greatest inconveniencies.

Were it not for the fire which lights us in winter, the greatest part of our time would pass in insupportable darkness ; and our most agreeable amusements would cease at sun set. We should then be obliged to remain motionless, or else to wander in horror of darkness, amidst ten thousand dangers. How melancholy would our state be, if, in these long evenings, we could neither make use of the resources of reading and writing, or enjoy the pleasures of society ! How unwholesome would our food be, and how little nourishment would it yield, if by means of fire it was not dissolved, softened, and prepared to a certain degree.

Nature and all its treasures would become useless without fire, and would lose, in our eyes, some of its greatest charms. But let us limit ourselves to the advantages which we derive from it at this moment. How comfortable is a room warmed by it, so as to guard us from the impressions of external air! We should be condemned to do nothing, at least to a thousand disagreeable sensations, during hard frosts, if the fire, by warming us, did not convey to us a certain activity. Many aged and sickly people would suffer doubly, were it not for the benign influence of fire. What would become of the new born infant, if its tender and delicate limbs were not warmed and strengthened by a gentle heat? Oh ! miserable people, who suffer all the rigour of a cold season, ready to sacrifice a portion of your bread in order to get fuel to warm your trembling limbs. I pity you from the very bottom of my heart ! Your condition reminds me of a part of my happiness, to which I have

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Ah! miserable people &c Jan^{y} 4th

hitherto paid too little attention; and imposes on me more strongly, the obligations of blessing the God of all grace, for the advantages which I draw from the heat of the fire. It also points out my duty to give part of my abundance to relieve the necessities of the indigent. O my God, my Creator and Benefactor, deign to look down upon me! Cause my heart to expand in praises and thanksgivings. I ascribe all the advantages, all the pleasures, which fire enables me to enjoy, to thy fatherly care over me. O may this useful element never become an instrument of vengeance to myself or others!

JAN. 5.

Winter Amusements.

DURING the present season, which, through prejudice, so many consider gloomy, every one according to his taste, seeks amusement to divert himself, and to make the long evenings pass away less tediously. Many to compensate their sufferings by cold are engaged in dissipation, in company, and vain pleasures. How lamentable is it to see the efforts which many people make to shorten days, alas! too short already, by idleness and trifling pursuits. The space of a day is often filled up by a train of employments, which are quite unworthy the dignity of man, and the purposes of his immortal soul. Hours after sun rise, the luxurious man quits his bed. He forms projects whilst at breakfast, for the amusements to which he means to sacrifice the new day.

Then abandoning himself to sloth, he waits the hour for a second repast : it comes, and he forgetting the consequences, gives himself up without bounds to the pleasures of the table. Surfeited with the immoderate use he makes of it, he throws himself on his couch, to recover sufficient powers to bear some new excess. The hour arrives in which he must go to a tumultuous company, unless, perhaps, the noisy circle is to assemble around him. Down he sits to play. Now, for the first time since the sun arose, he manifests that he has a soul ; and with cards in his hands, the time appears to him to pass too rapidly. This animal of a man goes at last from play, to the table, and from the table to bed ; but no sweet sleep does he find there. Frightful dreams or restlessness disturb his repose. But these are not the most reprehensible methods of lavishing days and wasting long winter evenings. Man is very ingenious in multiplying ways to shorten his time in trifling and vain amusements. He is sometimes induced to quit the town for the sake of hunting. Then he pursues the frighted hare, or fearful deer, who at the last gasp becomes the prey of the hunter, whose noise and inhuman pleasure, disturb the repose of the country and of nature. Luxury sometimes leads him to the ball, where he often loses his health, his peace of mind, and his innocence. Sometimes the pleasures of public places inchant him. There passions glide insensibly into his heart, or acquire new vigour there : passions which incapacitate him for tasting real pleasures. Again he is driven to other entertainments, to other diversions,which frequently also draw sins in their train.

But perhaps I have said enough of the amusements of winter. Permit me now to remind my fellow men of their duty in regard to them. 'Tis not the love of society which I blame; but this inclination must not degenerate into a strong passion; it must not take possession of the whole soul. Society may become hurtful to you, though nothing should pass contrary to virtue and good morals, if it takes up too much of your time; if it leads to the neglect of duties; or if your domestic affairs are at all deranged by it. Our Creator permits pleasures, for recreation only, and not for our daily work. I particularly advise you to be very attentive to your social pleasures. Avoid those which cannot be enjoyed, without endangering your virtue, your reputation, or the welfare and happiness of your family. Never let those mad pleasures find access into your heart, which may wound your neighbour, give rise to complaints, cause tears to flow, or which may make you neglect the duties of society and of religion. Let not even the most innocent pleasures, so far take possession of you, as to make you insensible to the pure and solid pleasures of Christianity, or take away your relish for religious duties.

O my God! do thou thyself govern my deceitful heart, and grant that I may never forget thee in the midst of earthly pleasures. Let the consideration of thine all-seeing eye being always upon me, guard me against temptations in the midst of the world! Let me be more attached to the exercise of my duties as a Christian, as a citizen, a father, or a child, than to the gratification of carnal de-

sires. There are always pure pleasures within my reach, even in winter; why then should I be so earnest about trifling amusements? If I find a desire to contemplate the works of God in nature, the stormy sky, the fields covered with snow, and many other phenomena of winter, will at once serve to amuse my mind, and to increase my devotion. Even in winter, the works of the Lord are great, and he who will reflect upon them, will continually enjoy a variety of pleasures.

JAN. 6.

The care of Providence towards Animals in Winter.

GOD gives the necessaries of life at this season of the year, to millions of rational beings, dispersed in the different countries of the world. Their wants are in proportion to their numbers, according to their condition, their age, and their manner of living. The more we see of our inability to form plans for own preservation, the more the arrangements of God, so full of wisdom and goodness, deserve our attention and admiration. But we must not be so selfish, as to confine the divine wisdom and goodness to the preservation of mankind alone, without remembering also the care which providence takes of other animals during winter; the number of which on the earth, is far greater than that of the rational beings who inhabit it

The preservation of human creatures is wonder-

ful, but the cares of providence towards animals, are still more astonishing proofs of the wisdom, power, and goodness of God. 'Tis not surprising that the prodigious number of animals which our globe contains, should find food or habitation in *summer*, because then all nature is disposed to concur towards that end. But that the same number of creatures, those millions of quadrupeds, of reptiles, of birds, of insects, and fishes, should continue to exist in pinching *winter*, is a circumstance which must excite the astonishment of every one capable of reflection! Most animals are by nature provided with a covering, by means of which they can bear the cold and procure themselves food in winter as well as in summer. The bodies of wild beasts, those inhabitants of forests and deserts, are so formed that the hair falls off in summer, and grows again for a winter's covering, till it becomes a fur, which enables them to endure the most severe cold. Many other kinds of animals find an asylum under the bark of trees, in old crevices, in hollows of rocks or in caves, when the cold obliges them to leave their summer dwellings. Some carry their food thither beforehand and thus live on what they gathered in summer; others pass the winter in a torpid state, and sleep away the cold season. Several sorts of birds possess an instinct which prompts them to change place at the approach of winter, to enjoy the comforts of a warmer climate. Some animals, not designed to travel, find, notwithstanding, their wants supplied in winter. Birds are instructed to find insects in moss and in the crevices of the bark of trees. Some

kind of quadrupeds, lay up provision in the summer time in caves, and feed on it in winter. Others are forced to seek their subsistence under snow and ice. Several sorts of insects, are at this season, confined to marshes and frozen rivers, and though deprived of food still preserve life. Perhaps too, many of God's ways and means to preserve animals, are yet concealed from us.

Let us adore our almighty and gracious Preserver, whose goodness and majesty do not cause him to disdain attention to the weakest creature under heaven.

From the mite to the elephant, all animals owe to him their food, their dwelling, their life; and even when nature seems barren of resources, God finds means to make amends for her poverty.

This consideration should strengthen our confidence in God. Why should care or anxiety find access to our hearts, or cause us to despair of being preserved during winter? That God, who provides with as much tenderness for all the animals, will not be unmindful of mankind. If he shews himself so great in small objects, he will be still greater in the more important.

The God who clothes all nature, will certainly clothe us. He who points out to animals a hiding place in the caves of the mountains, will find us an asylum to pass our days in quietness. Yea, will "cover us with his feathers!" He will provide for us in the most critical seasons.

Let these reflections lead us to imitate, as far as our faculties will permit, the kindness of Providence, by contributing to the preservation and hap-

piness of our fellow creatures, and even to the welfare of every living thing. Cruelty towards dumb animals is contrary to the will of our common Creator, who extends his beneficent care to beings far inferior to us. And if animals claim a right to our attention, how much more are we obliged to soften, as far as possible. the evils of our fellow creatures? Let us not deem it enough to supply our own wants, but let us endeavour also to supply the wants of others; and suffer none to sink under misery, whom it is in our power to relieve.

JAN. 7.

The pleasures of Winter.

THERE are pleasures and beauties peculiar to every season. Winter itself, though to many it may appear void of charms and pleasures, answers the ends of the Creator in this respect. For the sake of those, who through prejudice or ignorance, murmur against the season, I shall display the pleasures it affords, both to our senses and our hearts. How agreeable is the sight to behold the dawn of day shining on a country covered with snow! The thick fog, which covered the earth like a veil, and concealed every object from our view, vanishes all at once. The tops of the trees are whitened by a hoary frost. The small hills and valleys are imbued with the bright reflection of the sun, whose glorious influences gives new life to all nature. It invites the linnet to the grove, and the sparrow to perch from branch to branch.

In proportion as nature appeared dead in the absence of the sun, so much the more lively she appears when re-animated by it. How is the eye of the traveller delighted with her white clothing! Have you minutely marked the form of the snow? Have you reflected on the wonders which a single flake of it contains? On the one hand admire the regularity and symmetry of its form, and, on the other, the vast number of flakes which fall from the clouds. How agreeable is the sight, to see the hills, the forest, and the groves clothed with dazzling splendour! Behold, (for the eye never tires of seeing it) behold the splendid dress of those hedges! See how the forest bends under the white sheet that covers it! The whole appears like a vast desart, over which one uniform veil of dazzling whiteness extends itself! What idea shall we form of those, who, upon viewing these phenomena, feel nothing, or that do not conceive the pleasing sensations they are calculated to inspire! How much are they to be pitied, who at this moment, do nothing but murmur at the laws of nature! If the prospect in winter affords them no pleasure, I fear they will be equally insensible to all the charms of spring. How adorable is the wisdom of the Lord, and how unbounded his goodness in all that relates to winter! Nature is a divine masterpiece, however barren she appears to us; 'tis our blindness only which conceals its beauty from us. Some ray of divine wisdom shines in every part of nature, and there is still more which is concealed from us. 'Tis only what strikes our senses, and flatters our inclination, that we are attentive to. Many are like the brutes, who see

the sun, and other wonderful phenomena of nature without looking up to the Lord as the fountain whence all things proceed. Every man's mind must be filled with satisfaction, who accustoms himself to think with attention on the works of God at this season of the year. Though the air be troubled, the sky become stormy, nature spoiled of its charms, yet they will enjoy true pleasures in discovering, in all things, traces of the wisdom, power, and mercy of the great Creator. Though their natural faculties are much limited, they may always find subjects enough to employ their minds. They will have no occasion to go after the dissipations of the world, the amusements of dancing and playing. They will find either in their retirements, or in the midst of their friends and children pleasures ever real. Apply thyself, O my soul! to the enjoyment of these pleasures. Reflecting with care on the works of God, will soften the sorrows of life. Lift up thyself to God, and let him at all times, be the object of thy grateful praise.

JAN. 8.

On the Vegetables which preserve their Verdure in Winter.

THE earth now resembles a mother who has been bereft of her beloved children. She is desolate, and deprived of the charms which varied and decorated her surface. She has not, however, lost all her children. Some vegetables are still to be seen here and there, which seem to defy the severity of

the winter. Here the hawthorn presents its purple berries; and the laurestinus displays its blossoms in clusters, crowned with never fading leaves. Like a pyramid raises the yew tree, and its leaves preserve their verdure; the faint ivy creeps along the walls and remains immoveable while the tempest roars around it. The laurel has lost none of its summer ornaments, but still extends its green branches. The humble box peeps here and there above the snow, and appears ever green. These, and some other trees, preserve their verdure in the coldest climates, and in the severest seasons. Sweet emblems of the durable advantages which the man possesses whose mind is cultivated, and whose temper is mild and serene. Splendid attire, which only dazzles the eyes of the vulgar, is trifling and vain, the most beautiful complexion will fade, and all outward brilliancy is of short duration; but virtue has charms that outlive every thing. The man who fears the Lord is, "like a tree planted by "water courses. It grows and flourishes, and its "branches extend far off. It produces fruit in its "season, and its leaves fade not. It refreshes him "who flies to it for shelter, and the traveller blesses "it." How just an image of a real Christian. His value arises not from the arbitrary goods of fortune. His true ornaments are *in himself;* not by nature, but by divine grace. He may be shaken by the storms of adversity, but they cannot overturn him; he soon lifts up his head above the storm. If by misfortune he be reduced to poverty, he is still rich in the possession of the divine favour, a good conscience, and the hope of a blessed immortality.

This meditation leads me to reflect on a benevolent and good old man. In the winter of his life, he resembles the plants which constantly preserve their verdure. He has born up with constancy under the many storms of fortune. He has seen many beautiful objects wither! Still he exists, almost without a contemporary! He discovers a mild cheerfulness, the happy remains of his spring! though his forehead may be wrinkled, and the hand of time may have made ravages on his body, still he is adorned with virtues and the graces of the Spirit, which make amends for the loss of exterior charms. In his children he grows young again, and his wisdom, his experience, and his integrity still serve for examples to all around him. O that this may be a just picture of the winter of my life! After having lost all the charms of youth, and of riper age, may I blossom again in old age, like a fruitful tree, and inspire by my graces, veneration and esteem! The beauty of my body will shortly fade like a summer flower. How happy for me, if I have no reason to regret the loss of it! Happy if I have these adornings which will not wither even in the grave!

JAN. 9.

On the singular state of Man when asleep.

WE need not have recourse to extraordinary events, in order to know the wisdom and omnipotence of God. Things the most common, even the daily changes which happen in nature, and in

our own bodies, are alone sufficent to convince us, in the most forcible manner, that he who created the world and who directs every event in it, is a Being of infinite and glorious perfection. I shall now only mention one of the many great wonders of which he is the author; and notwithstanding it happens daily, it is not the less worthy to be remarked, and to become the object of our admiration. How many have been refreshed by sleep, who possibly have never reflected on that state, or, at least, have never considered it as one of the effects of divine goodness! They do not imagine that any thing extraordinary happens when balmy sleep comes upon them; they suppose the machine, their body, is formed for that situation, and that their inclinations to sleep proceed purely from natural causes.

But, perhaps, sleep may be considered in a twofold light: on the one hand, there is nothing in it which may not necessarily result from our nature; on the other, there is something in this natural effect so wonderful, that it is well worth a closer examination. It is, in the first place, a proof of the wisdom of God, that we go to sleep imperceptibly. Let us only try to watch the moment in which we are falling asleep, and that very attention will cause it to fly from us. We cannot sleep till that idea is lost. Balmy sleep comes uncalled. Reflection has no share in this particular change of the manner of our existence, and the more we endeavour to promote it, the less we seem to succeed. God has so directed sleep, that it should become an agreeable necessity to man; and be

quite independent of his will and reason. Let us further reflect on the wonderful state we are in while we are asleep. We live, as it were, without knowing or feeling it. The throbbing of the heart, the circulation of the blood, the digestion, the regular separation of the juices, in short, all the animal functions continue, and operate just in the same manner. For a time the activity of the soul appears to be suspended, and by degrees loses all sensation, and all distinct ideas. A deadness seizes the senses, and interrupts their usual operations: by degrees the muscles move more slowly, till all voluntary motion ceases. This change first begins by the forehead; then by the muscles of the eyelids, the neck, the arms, and the feet, all lose their activity to such a degree, that men appear to be metamorphosed into the state, almost, of a plant. Such is the situation of the brain, that it cannot transmit to the soul the same ideas as when awake. No object is seen by the soul, though the optic nerve is not altered, nor would it see any thing, even if the eyes were not shut. Though the ears are open, they do not hear. In short, the state of persons asleep is in all respects wonderful. Sleep is the image of that state which death reduces us to. There is such a resemblance between sleep and death, as is worthy of our particular observation. Who can think of the former without recollecting the latter? As we now fall imperceptibly into the arms of sleep, so shall we one day fall into those of death. Death, 'tis true, often gives previous warning of his approach; but the moment in which he actually seizes us, comes suddenly; and when we

seem to feel but the first blow, it proves to be the last. The senses become inactive, the ideas are confused, and we forget the objects which surround us. Perhaps too the moment of death may be as agreeable to a good man as the moment of falling asleep. The convulsions of some dying people may not be a more disagreeable sensation to them than snoring is to those asleep. This is a subject we ought often to remember. Let us reflect, whenever we seek repose in bed, on all the wonders of sleep, and bless that kind Preserver who does such great things for us, even while we slumber. Great things indeed! for to what a variety of dangers should we be exposed in the night, if he did not guard us with a protecting hand! Were it not for his superintending care, the first sleep after we are born would prove our last, and deliver us into the arms of death.

Let us attentively reflect on all these things, and we shall soon see what constant obedience is due to so great a Benefactor. Then, with grateful joy, shall bless the Lord, who proves himself to be our God in every circumstance through life.

Jan. 10.

The advantages of the Climate we inhabit.

O THAT we were sensible of our happiness in all respects! For the blessings of God are poured in upon us on every side. The divine goodness, and our felicity, appear, whether we view the forests, the hills, the meadows, the day, the night, and all

the variations which attend them. Shall we then be discontented with our lot, and complain of the economy with which God distributed his blessings? Shall we murmur that we have not a perpetual summer, that the sun does not always shine upon us, and that an equal degree of heat is not always felt under our temperate zone? What base ingratitude! and, at the same time, what inexcusable ignorance! We know not what we wish, or of what we complain. Is it through pride or carelessness, that we do not see God's particular kindness with regard to our countries We often murmur at the severity of the winter. We are even mad enough to envy the inhabitants of other climes, where this change of season is unknown. But is it not the winter that makes our own climate one of the most healthy in the world? The hotter the countries, the more they are exposed to epidemic diseases; nor do the people live so long as in our climate. Besides, the men are not so robust and population is not so great as among us. And when the cold is at the highest possible degree with us, still we are much more comfortable than the inhabitants of the frigid zone, to whom our severest winters would appear to have the mildness of autumn. Let us compare our situation with that of the inhabitants of the northen parts of our globe. Here, in the shortest days, some rays of the sun come to brighten our cloudy sky, and revive our spirits; there, neither days nor nights are enlivened by the light of that beneficent globe. Here in our beds, and by means of a warm fire, we are secured from the severity of the cold; there, disturbed and

attacked by fierce beasts, men dread them more than the cold; nor are their poor cottages a defence from those different kinds of enemies. The pleasures of society with us, soften the inconveniencies of the winter; but near the north pole, the unhappy mortals are almost shut out from the rest of the earth, and live dispersed in clans. 'Tis our happiness to see the succession of day and night, while they pass most of their lives in darkness. With us the return of spring makes amends for all the disagreeables of winter; they, on the other hand, do not see nature revive; but an external winter reigns with them. Let us bless that kind hand, which has appointed for us so happy a lot. Instead of lamenting our fate, let us glorify the God who has planned with such wisdom and goodness; and in the midst of our enjoyments, let us think of those unfortunate people who are deprived of the pleasures to which custom renders us too insensible. When we think of our happy situation, penetrated with joy and gratitude, let us say, "We give thee thanks, O bountiful Jehovah, for having fixed us in a climate "where thy bounty is so magnificently displayed. "May our gratitude, our joy, our endeavours to "to please thee, be in proportion to the distinguishing blessings we enjoy! May the beauty and "fertility of the country we inhabit, excite us to "think on thy works and thy blessings; and may "we one day arrive at that heavenly and eternal "habitation, which Christ has prepared for us, "and where we shall adore, with the faithful of all "nations the miracles of thy goodness. Amen."

JAN. 11.

On the fertility which Snow gives to the Earth.

WE might say, from appearances alone, that snow cannot be useful to the earth; and one might suppose that the cold moisture which penetrates the ground from the snow would be hurtful to trees and plants; but we are freed from this prejudice, by the experience of all ages. Nature cannot give a better covering than snow, to secure vegetation from the ill effects of cold. Though cold in itself, it shelters the earth from freezing winds; it maintains the warmth needful for the preservation of seeds, and helps to swell them, by the moistness of the saline particles it contains. Thus the all-wise God prepares what is necessary for the support of the beings he has formed, and provides beforehand for our subsistence, and for that of an infinite number of animals.

Nature is always active, even when she appears to us to rest; and she lends us her aid even when she seems to refuse it. Let us in this admire the tender care of Divine Providence. God is attentive to our welfare, even in the severest seasons; and without any labour of ours he silently prepares for us all the treasures of nature. With such constant proofs of his beneficent care who would give way to fears and anxiety? God does daily for the preservation of mankind, what he does every winter in nature. That which appears to us useless or hurtful, contributes to make us happy; and when we may imagine that God does not regard us, even then his

secret purposes are coming to maturity—we find ourselves delivered from threatening dangers, and invested with blessings for which we did not dare to hope.

God has not only designed the snow as a covering for the earth, but that it should at the same time make it fruitful. How much trouble and care does it cost us to give the necessary manure to the fields; but how easily is it done by nature? The snow, in this respect, possesses superior virtue. When it is dissolved by the sun, or by a temperate air, the saltpetre contained in it, enters deep into the earth, and gives new life to the roots of plants.

Shall we not, on this occasion, recollect the emblem under which God represents to us the wholesome efficacy of his word? "For as the rain cometh "down from heaven and the snow, and returneth "not thither, but watereth the earth, and maketh it "bring forth and bud, that it may give seed to the "sower and bread to the eater, so shall my word "be that goeth forth out of my mouth; it shall not "return unto me void, but it shall accomplish that "which I please, and it shall prosper in the thing "whereto I sent it." We live in an age when this prophecy is accomplished in a remarkable manner. Whole kingdoms and provinces, even a great part of the globe which not long ago was buried in the grossest ignorance, superstition, and unbelief, are now enlightened by the glorious gospel of Christ. Even in our days, we feel the happy influence of the word of God. How many hardened hearts has it softened! What prejudices has it conquered and triumphed over! and what good works have

been produced by its powerful influence! O may this blessed seed ever find in our hearts a soil prepared and disposed to bring fruit to perfection!

JAN. 12.

Contemplation of the Starry Heavens.

EVERY attentive observer of nature must be astonished at the wonderful sight which the sky presents to him. But whence is it, that so few consider the firmament with attention? I am willing to think that it generally proceeds from ignorance; for it is impossible to know the greatness of the works of God, without feeling an almost heavenly rapture. O how I wish you to share this divine pleasure!—for this purpose raise your thoughts towards the sky. If I only name the immense bodies that are strewed in boundless space, it will be enough to fill you with astonishment at the greatness of the Artificer.

In the centre of our system, the throne of the sun is established. That vast body is more than a million of times larger than our earth. It is near one hundred millions of miles distant from it, and notwithstanding this amazing distance, it has a most sensible effect upon our world. Nineteen globular bodies, if not more, move round the sun; seven of these are called planets, the rest are called moons, or satellites. They are in themselves dark bodies, and receive light, heat, and perhaps interior motion, from the sun. Mercury, Venus, the Earth, Mars, Jupiter, Saturn, and Georgium Sidus, are the names

of the seven principal planets. Of these Mercury is nearest to the sun, and is for that reason commonly invisible to astronomers. Being nearly thirteen times smaller than our earth, he adds but little ornament to the sky. He is followed by Venus, who is sometimes called the morning, and sometimes the evening star. It is one of the brightest of the heavenly bodies, whether it appears in the morning or in the evening. It is nearly as large as our earth, and its distance from the sun is about sixty-eight millions of miles. The Earth comes after Venus. The Moon moves round her as a secondary planet. Mars is the fourth planet, and is about seven times smaller than our globe. Its distance from the sun is supposed to be about one hundred and forty-four millions of miles. Jupiter is surrounded by a belt, and is always destinguished by his bright splendour in the starry heavens. It seems in size to be greater than the fixed stars. It is nearly as bright as Venus in all her glory, except that the light is less brilliant. How insignificant is our earth in comparison of Jupiter! The distance of Saturn from the sun is said to be upwards of nine hundred millions of miles; and he was thought to be the remotest planet, till the late discovery of the Georgium Sidus, whose distance is reckoned at eighteen thousand millions of miles, and its magnitude eighty-nine times larger than our earth. But it must be considered that the sun, with all the planets which accompany it, is but a very small and inconsiderable part of the immense fabric of the universe. Every fixed star, which appears to us no larger than a diamond set in a ring, is, in

reality an immense body, equal to the sun in size and splendour. Each fixed star then, is not only a world, but likewise the centre of a planetary system: in this view must we consider the stars which glitter in the sky in a clear winter's evening. They may be distinguished from the planets by their brilliancy, and by their appearing stationary in the sky. From their apparent size, they are divided into six classes, which altogether comprehend about three thousand stars. But though some have endeavoured to fix the exact number of them, their efforts have been in vain. Telescopes have opened to us new points in the creation. By their assistance, millions of stars are discovered; but it would be folly to fix the bounds of the universe by those of the telescope. Let us reflect on the immense distance between the earth and the fixed stars, and we shall have new cause to admire the greatness of the creation. We know indeed already by our senses alone, that the stars must be further from us than the planets. 'Tis only their distance that makes them appear so small; and in reality this distance is immeasureable, for a cannon ball, on the supposition it were always to preserve the same degree of swiftness, would scarce reach the star nearest to our earth, at the end of 600,000 years! What then must we conclude the stars are? Their brightness and astonishing distance indicate that they are suns, which reflect their light to us; suns which God has sown by millions in the immensity of space; each of which is probably accompanied by several terrestrial globes, which it illuminates.

But all these observations, however surprising,

do but just bring us to the first limits of the creation. Could we transport ourselves above the moon; could we reach the highest star above our heads we should instantly discover new skies, new stars, new suns, new systems; and perhaps still more magnificently adorned. But even there, the vast dominions of our great Creator would not terminate; we should then find to our astonishment, that we had only arrived at the borders of the works of God. 'Tis but little that we can know of his works, but that little should teach us to be humble, and to admire the divine power and goodness. How great must that Being be who produced these immense globes out of nothing! who regulates their courses, and whose mighty hand directs and supports them all! What is the clod of earth which we inhabit, with all the magnificent scenes it presents to us, in comparison of those innumerable worlds? Were this earth annihilated, its absence would no more be observed than that of a grain of sand from the sea shore! What then are provinces and kingdoms when compared with those worlds! They are but atoms dancing in the air, which are discovered to us by the sun beams. What then am I, when reckoned among the infinite number of God's creatures? I am lost in my own nothingness! But little as I appear in this respect, I find myself great in others. There is great beauty in this starry firmament which God has chosen for his throne! How admirable are those celestial bodies! I am dazzled with their splendour, and enchanted with their beauty! But notwithstanding this, however beautiful, and however

richly adorned, yet this sky is void of intelligence. It is a stranger to its own beauty, while I, who am mere clay, moulded by a divine hand, am endowed with sense and reason. I can contemplate the beauty of these shining worlds: nay more, I am already, to a certain degree, acquainted with their sublime Author; and by faith I see some small rays of his divine glory. O may I be more and more acquainted with his works, and make the study of them my employ, till, by a glorious change I rise to dwell with him above the starry regions!

JAN. 13.

On the discoveries made by the Microscope.

WHAT nature is in large objects, she is also in small ones. There is as much order and harmony in the formation of the mite as in that of the elephant. The only difference lies here, the weakness of our faculties prevents us from penetrating far into the nature and organization of small bodies, which often elude our sight, and which can only be perceived by the assistance of glasses. Microscopes have introduced to our acquaintance a new world of vegetables and animals. They inform us that those objects which cannot be discovered by the naked eye, have extent, parts and form. I shall adduce a few examples to lead us to praise that God whose glory is so wonderfully manifested in small objects. When we examine a grain of sand with our eyes only it appears round; but, by the help of a glass we discover, that every grain

differs in size and form; some are square, others conical, some perfectly round, but most irregular. But what surprises most, is, that by means of glasses which make objects appear a million of times larger than they are, we may discover, even in grains of sand, a new world of animals; for it has been ascertained that their cavities contain insects. Many cheeses swarm with mites; to the naked eye they appear mere dots; but with a microscope they are proved to be insects of a very singular figure; they have eyes, feet, mouth, and a transparent body furnished with long hair in the prickly form.

The mouldy substance which usually adheres to damp bodies teems with life! It plainly exhibits a thick forest of trees and plants, where you may easily distinguish the branches, leaves, flowers, and fruit. The flowers are borne by long white transparent stalks. The bud is but a little green ball before it opens; but when it is blown it becomes white. You would no more expect to find these objects in mouldy substances, than that meal which covers the wings of a butterfly should be a heap of small feathers, if the microscope had not proved the truth of it. But we need not carry our researches to remote objects; we may limit them to ourselves. If you examine with a microscope the surface of your skin, you will find that it resembles the scaly surface of a fish. Some have computed that a grain of sand will cover two hundred and fifty of these scales, and that only one of them covers five hundred pores, and consequently, that a space equal to a grain of sand must contain one hundred and twenty-five thousand pores.

We see then how great our adorable Creator is, even in things, which, through prejudice, we consider as trifles. What an immense number of things has God spread over the earth! What we see are but the least, and perhaps the meanest of his works. Many objects in nature are concealed from our view. We know already above thirty thousand plants, and several millions of insects. But how little is that in comparison of the whole! If the bottom of rivers and seas could be opened to our view, and could we transport ourselves to other planets, how should we be lost in wonder at the immense number of God's creatures! His wisdom shines in the most minute, as well as in the largest objects. Nature is as complete and regular in all her smallest productions, as in those vast bodies whose circumference is reckoned by millions. The same hand feeds the insect that crawls in the dust, and the whale that appears in the midst of the sea. Let us imitate his example: let the meanest of creatures feel our benevolence, since our common Lord feeds us all, and deigns to preserve their existence.

JAN. 14.

On the advantages of Night.

Now the sun withdraws his light from us so soon and the greatest part of our time is passed in darkness, we are, it is true, deprived of some pleasures. Yet we have no reason to complain of this arrangement of nature 'Tis wisely ordained that there

should be a mixture of good and evil, pleasure and pain in this life; and the same wisdom and goodness are seen in the variations of our climate. 'Tis reasonable to maintain that the winter nights are more advantageous than hurtful to us; or, at least, that their apparent inconveniencies are softened by a thousand blessings which we are too insensible of. Being deprived of the light of the sun, should lead us to consider more of its utility. We should not feel the same sensation of pleasure upon his return, if he constantly shone upon us. Every night should remind us of the mercy of God, who for the benefit of mankind has spread light and beauty over the earth. In what misery should we languish, if light did not succeed the darkness! Do not the tranquillity and repose which attend darkness invite us to enjoy a sweet sleep? How many labourers, who in the day waste their strength in our service bless the night, which suspends their labour, and brings them to ease and sleep! We are generally too selfish in measuring the advantages and disadvantages of night, merely by the use or hurt we think we draw from it. However disagreeable long nights may be to some, they are to others a very great blessing. In some places the night is favourable to the huntsman and the fisherman. Without it how could the astronomer have formed any idea of the distance, the size, the course, and the infinite number of planets and stars? Night appears to me a benefit to mankind, considered in another view: it lessens our wants, and it puts an end to those sorrows which in the day time cost us

many tears and cares. How many families oppressed with want begin the day with sorrow and end it in hard labour! night comes, and their care and misery are suspended. Nothing then is wanted but a bed to render them happy; and if sleep close their eyes, all their wants are satisfied. Night, in some degree, puts the beggar upon an equality with the monarch: they both enjoy a free blessing. O how gracious is that God, that has combined all things for the happiness of mankind! Most things which are called evils, are only so to those who suffer themselves to be carried away by passion and prejudice. Were they properly considered, it would appear that these seeming evils are real blessings to the world. We may rest assured, that some millions of our fellow creatures, who are employed in the day time in hard and fatiguing labour, others who have groaned all day under the cruel hand of a tyrant, and many who travel by sea and land, will bless God at night's approach, which brings rest along with it. And let us also bless him every morning. Let us try to render sleep pleasant by well spending the day; then shall we find additional reason to praise God when we awake. The shorter our days are, the more we should value every hour, and prudently improve the flying moments. "The "night cometh in which no man can work." But long as that night will be, still it will be a blessing, if we enjoy in the grave that rest and peace which flow from union with Christ, and from holy obedience to his blessed precepts.

JAN. 15.

Reflections on myself.

How reasonable that we should sometimes turn our eyes from foreign subjects to ourselves. It has too often been the case with me, in my reflections on the things around me, to forget myself; at least I have not always endeavoured to excite in myself that veneration and gratitude, which the sight of the heavenly bodies, and the blessings of earth ought to produce. I will now turn my thoughts on what most intimately concerns me, and try to convince myself more than ever, that, as a man, I am as much the master-piece of divine wisdom and power as those prodigious bodies, the greatness of which overwhelms me with astonishment. How wonderful is the union of my body and soul! How incomprehensible is their connection and reciprocal acting on each other. I experience daily that when the rays of light strike my eyes, my soul is impressed with the idea of the size, the form, and the colour of surrounding objects. I find too, that when a certain undulating motion is raised in the air, my soul is impressed with the idea of a sound. I perceive a thousand changes which happen around me. I constantly find, that as soon as my soul wills it, my body transports itself from place to place; and that the soul exercises a power over all the members of my body; which are disposed to obey every act of its will. These are incontestible facts; and yet I know not the manner in which they are effected. In this mutual influence of body and mind, there is

a depth of wisdom and skill which I cannot fathom; and the more I think of it the more I am astonished. Were we to consider the body separately, it would appear a master-piece of the creative hand. Here nothing is wanted, nor is any thing superfluous; each member is placed in the manner best adapted either for the use or ornament of the body. It would be unreasonable to desire a limb more than is necessary to form a perfect body; and, on the other hand, suppose that only one was wanted or that my limbs were transposed, so that my eyes, for instance, were set in my feet, or fixed where my ears are, what inconvenience should I be subject to! How deformed should I appear! If so much wisdom be discovered in the exterior form, the interior parts are still more admirable. My body was intended to serve more than one purpose. First, it was to be the means of conveying information to the soul of the presence of objects not within itself. The different organs of sense answer this end, and each of them is a miracle of divine wisdom and power. But it was necessary the body should be moveable, in order to transmit to the soul different sensations of exterior objects; and how many of its parts concur to answer this end! The joints, the bones, the sinews, the muscles, susceptible of contraction or extension, invest me with power to move a thousand ways! my body, considered as a machine, wonderful as it is, would waste by its motions and functions, were not its losses repaired; other parts, therefore, besides those we have noticed, were necessary; some to receive nutriment, others to grind it, to divide the juice,

and to make these again circulate through the whole system as each part requires. All these different parts actually exist in my body, and completely answer the end for which they were designed.

O Lord, I bless thee for having made me so wonderfully. Thy works are all admirable, and my soul delights in acknowledging it. I am one of the prodigies of thy power. My frame witnesses thy glory. Whenever I exercise the faculties of my body, whether I breathe, walk, or rest, may I praise thee! May I eternally rejoice in thee; and may my body be a living temple, in which the Eternal Spirit will manifest his presence, and establish his residence for ever.

Jan. 16.

On the Hurt occasioned by excessive Cold.

Why are men so ready to remark whatever inconveniences the laws of nature may sometimes occasion? Why do they dwell upon it, and complain of it, while they pass over in silence the many advantages they enjoy? In this respect they act towards God as they do towards each other. The smallest offence, the least harm, even from a friend or benefactor, is often resented, and makes them forget the most essential services which have been done them. These remarks are particularly needful at this season. Men are more attentive to the evils which the cold may occasion, than to the benefits which the earth may receive from the frost. Should they discover the least harm, should any

part of the great whole be injured, they fancy they are authorised to murmur against God, without considering the advantages which, upon the whole, nature may draw from the cold.

Let us now, without partiality, weigh the evils and advantages which may be attributed to the cold, and we shall soon be convinced how little reason we have to blame the government of an infinitely wise and good providence. 'Tis true, indeed, that severe cold is attended with inconveniencies and troublesome consequences. Sometimes, and in some places, the water freezes to such a depth, that it is impossible to make use of the springs. The fish in the ponds die. The rivers sometimes overflow, and the flakes of ice make great ravages. The stopping of the water-mills soon produces a general want of bread. Fuel fails, or at least becomes very dear. Many of the vegetables suffer, and some are destroyed, if not covered. Some animals die through cold and hunger. Man's health, or even life, is often exposed to danger. These are some of the most obvious evils which the severity of the season may occasion. But many winters are passed without them; and even though some animals should sink under it, and some plants perish by reason of the cold, what is this when compared with the advantages we derive from it! Let us be more careful in the opinions we form of the ways of the Almighty. As we know so little, and are so incapable of taking in the whole chain of causes and effects, how should we form an adequate idea of what is hurtful or useful in nature? It would be quite unreasonable and unjust to blame

the whole on account of some partial evils. Rather let us confess our ignorance, and rest assured that there is much more good than evil in the world. Many things beyond all doubt, which from self-interest we consider as hurtful, contribute to the general good. With such reflections as these, we shall be calm in the midst of all events; and whatever may be our lot, we shall have constant reason to bless our wise and gracious God.

JAN. 17.

On the Repose of Nature during Winter.

WINTER is a time of rest to nature. She employed herself in the preceding months in fulfilling the designs of God, by labouring in the service of his creatures. The spring was rich in blossoms; it opened many seeds, and the summer has ripened abundance of fruit for us to gather in autumn! We are constantly receiving some presents from nature. She pleases our sight, delights our smell, indulges our taste, and sometimes she satisfies them all at once. She employs herself, like the good mother of a family, from the morning till the evening of the year in procuring for us, her children, the necessaries, the conveniences, and the sweets of life. We draw from her maternal bosom, food, clothing, amusement! For us she has caused the grass to grow, for us she has loaded the trees with leaves, with blossoms, with fruit. See how she covers for us the fields with corn! See how the vine produces its invigorating fruit! For

as she has adorned the creation with a thousand charms! But, as if fatigued with so many cares, nature now rests; this, however, is only to collect new force, again to be employed for the good of the world. But even this rest, which nature enjoys in winter, is a secret activity. A new creation is preparing in silence. The necessary dispositions are already making, that the desolate earth may again recover the children she has lost. The corn, which is to serve us for food, already shoots. The fibres of plants, which are to adorn our fields and gardens, begin insensibly to open. O my beneficent Creator! here I find fresh cause to adore thy wisdom and power. The repose which nature takes is as worthy to enter into the plan of thy wise providence, as the activity she shews in spring and summer. Thou hast wisely combined the several revolutions of the earth, thou hast equally divided its rest and labour. 'Tis thy will that each day should vary the scenes of nature, in that way which is most proper for the perfection of the whole. Pardon, O God! my temerity, if I have been so stupid as to blame any thing in the government of the world. I am more than ever convinced that all the plans of thy providence, though they may appear extraordinary to my weak reason, are replete with wisdom and goodness.

While I now see the earth covered with a mantle of snow, which keeps it warm, I would reflect on the good that results from it; for if nature did not enjoy some rest, how could we expect flowers and fruit? If thou didst not dispose the seed to flourish under the snow, how could we chaunt the

harvest hymn? Yes, O my God, it is thou, who in giving rest to the earth, enrichest man with ten thousand blessings! For me, also, there will come a day of rest from all trouble, cares, and sorrow. Thou hast wisely appointed the number of my days. Now is the spring and summer of my life, which must be spent in the service of God and my fellow-creatures. The autumn will soon arrive: may I then resemble one of those fruitful trees which yields its abundance for our supplies. But when in the winter of life, I shall be covered with grey hairs and full of days, I earnestly pray that my rest may be as honourable and beneficent as that of nature in winter.

O that my contemporaries may have reason to say, when speaking of me,—"That old man formerly devoted his youth to God, and to endeavour to serve mankind. His life has been full of activity, of use, and of benevolence. He contributes by his wise experience to the happiness of his family and friends; and soon will he enter into that rest which remains for the people of God."

The chief repose which I can promise to myself here, is little else but a preparation for new trials. O how my soul exults in prospect of that rest which awaits me in the grave, and in the bosom of my God to all eternity! There my repose shall be uninterrupted: there the recollection of past afflictions will fill my soul with inexpressible joy. In the firm expectation of so glorious a rest, I will zealously attend to the duties that devolve upon me, and will devote my talents and all my powers to the glory of God, and the good of my fellow-creatures.

Strengthen me, O God by thy grace in this holy resolution!

JAN. 18.

On the Laplanders.

I ENTER upon this reflection with a lively sense of gratitude to my Creator, and of pity to those of my race to whom nature seems to have been more sparing of her blessings. I turn mine eyes towards Lapland, and the inhabitants of the places nearest the north pole: mortals whose taste and manners of living are not the happiest, when compared with ours. Their country is a chain of mountains covered with snow and ice, which do not melt even in summer. The chain is sometimes interrupted by bogs and marshes. A deep snow overwhelms the low lands, and covers the little hills. Their nights are long, and their days give but little light. The inhabitants fly to tents for shelter from the cold. These tents are moveable; their fire-place is fixed in the middle of them, and surrounded with stones. The same hole which carries off the smoke, serves them also for a window. Iron chains are fastened up here, to which they hang their caldrons, to melt ice and dress their food. The inside of the tents are furnished with furs, which keep out the wind. They sleep on the skins of animals spread upon the floor; here they pass their winter. Half the year is to them perpetual night, in which they hear nothing but the howling of wolves (who are searching every where for prey) and the whistling of the

piercing wind. Such a climate and way of life would to us be intolerable. How should we think ourselves to be pitied, had we nothing before our eyes but large fields of ice, and whole deserts covered with snow; the cold rendered still more insupportable by the absence of the sun! How miserable should we be, had we no other dwellings than moveable tents made of skins; no other resource for our subsistence but in dangerous and painful hunting for it; and if we were deprived both of the pleasures produced by the arts, and of the society of our fellow-creatures!

Surely these remarks should lead us to think more of the advantages which we enjoy. Let us bless God for his distinguishing favours: for what are we more than others? more than the Laplanders? Let us be thankful that we live in so temperate a clime, and that we have such numerous ways of guarding against the cold. Let us likewise bless the great Governor of the universe, for granting us in the midst of winter the delightful prospect of spring, the very idea of which cheers the heart, and enables us to support present evils.

But are the inhabitants of Lapland so unhappy as we imagine? Certainly they wander painfully through rough valleys and unbeaten roads, and are exposed to the inclemency of the weather; but their hardy bodies are able to endure fatigue. They are deprived for several months of the light of the sun; but to render the darkness of the night more supportable, the moon and the *Aurora Borealis* illuminate their horizon. They are armed by custom and education against the severity of their cli-

mate; and though buried in snow and ice, it does not render them unhappy: their hardy life enables them to brave the cold. Nature has made it easy for them to obtain what is indispensably necessary. She has discovered to them animals whose fur defends them from the sharpness of the air. They have the rein-deer, which at once furnishes them with their tent, their bed, and their food; with which they undertake long journeys, and which, in short, supplies almost all their wants: at the same time, its maintenance is no trouble or expence to them. Had these poor creatures, in the midst of the misery of their condition, a more perfect knowledge of God, through his eternal Son Jesus Christ; such a knowledge as the Bible furnishes us with: and were they civilized, they would draw from friendship and from the gospel those consolations which would render their situation far more pleasant and agreeable. And if, as some suppose, the idea we form of happiness depends more on opinion than reason, and if real happiness be not confined to particular persons or places, and that with the necessaries of life, and the peace of God in the mind, a man may happy in any corner of the earth, may we not ask what that Laplander wants in nature to make him happy?

JAN. 19.

On the wise Ordinance of our Globe.

ALTHOUGH the human mind, by reason of its limited capacity, cannot go to the bottom, nor con-

ceive the whole of the plan that the Creator executed in forming the world, we may nevertheless by the use of our senses and the faculties with which God has endowed us, discover enough to make us acknowledge and adore the divine wisdom. To be convinced of this, we need only consider the form of the earth. It is known to be globular, and in shape nearly like an orange. And why has God chosen that form? With a view that it might be inhabitated by living creatures over its whole surface. In order to this, every part of the globe must have sufficient light and heat, the wind must have a free circulation, and the water must be diffused over all its parts. The rotundity of the earth is best calculated to promote these conveniences: for this round form admits light and heat, without which here could be no life all over the globe. The revolutions of day and night, the changes in the temperature of the air, heat, cold, dryness, or moisture, could not have taken place without this form. Had the earth been square, had it been conic, had it been an hexagon, or any other angular form, what must the consequence have been? The greatest part of our earth would have been drowned, whilst the rest would have languished with drought. Some countries must have been torn in pieces with storms, while others would have been deprived of the wholesome circulation of wind. I have new reason to admire the supreme wisdom, when I reflect on the enormous mass which composes our world. Were the earth softer, or more spongy than it is, men and animals would sink into it: were it harder and less penetrable, it would resist the toil of the labourer,

and lose its capacity for producing and nourishing the multitude of plants, herbs, roots, and flowers, which now spring out of its bosom. There are regular and distinct strata found in the earth ; some of stone, others of metals and minerals. There are numerous and evident advantages which result from these in favour of mankind. Do not the strata of gravel, sunk deep in the earth, purify and in a manner filter the water, and render it sweet and fit for use ?

On the surface of the globe there is a varied prospect ; there is an admirable mixture of plains and valleys, of small hills and mountains. The man must be blind indeed that does not see the wise purpose of the great Author of nature, in thus diversifying the surface of the earth. Were the earth an even plain, how much beauty would it lose ! Besides, this variety of valley and mountain is very favourable to the health of living creatures : and were there no hills, the earth would be less peopled with men and animals. There would be fewer plants, fewer simples and trees. We should be deprived of metals and minerals : the vapours would not be condensed, nor should we have either springs or rivers. Must we not then acknowledge that the whole plan of the earth, its form, its inward and outword construction, are all regulated according to the wisest laws, which all combine towards the pleasure and happiness of mankind.

O thou supreme Author of nature, thou hast done all things well ! Which ever way I turn my eyes, whether I penetrate into the interior structure of the globe thou hast appointed me to inhabit, or whether

I examine its surface I every where discover marks of profound wisdom and infinite goodness.

JAN. 20.

Meditations on the works of God, drawn from the sacred Scripture.

"HEARKEN unto this, O Job! stand still and "consider the wondrous works of God."—Job xxxii. 14. "He hath established the world by his "wisdom, and hath stretched out the heavens by "his discretion."—Jer. ix. 12. "And God said, "Let there be light, and there was light: and God "saw the light that it was good, and God divided "the light from the darkness; and God called the "light day, and the darkness he called night."—Gen. i. 3, 4, 5. "O Lord my God, thou art very "great, and art clothed with honor and majesty. "Who coverest thyself with light as with a gar- "ment; who stretchest out the heavens like a cur- "tain; who layest the beams of his chambers in "the waters; who maketh the clouds his chariot; "who walketh upon the wings of the wind; who "maketh his angels spirits; his ministers a flaming "fire; who laid the foundations of the earth, that it "should not be removed for ever. Thou coverest "it with the deep as with a garment: the waters "stood above the mountains"—Psal. civ. 1—7. "He stretcheth out the north over the empty place, "and hangeth the earth upon nothing. He bind- "eth up the waters in his thick clouds, and the

" cloud is not rent under them. He divideth the " sea with his power, and by his understanding he " smiteth through the proud." Job xxvi. 7, 8, 12. " For he maketh small the drops of water: they " pour down rain according to the vapour thereof, " which the clouds do drop, and distil upon man " abundantly. Also can any understand the spread- " ings of the clouds, or the noise of his tabernacle; " Behold he spreadeth his light upon it, and " covereth the bottom of the sea."—Job xxxvi. 29, &c. " God thundereth marvellously with his voice, " great things doeth he, which we cannot compre- " hend. For he saith to the snow, be thou on the " earth! likewise to the small rain, and to the great " rain of his strength. He sealed up the hand of " every man, that all men may know his work. " Then the beasts go into their dens, and remain in " their places. Out of the south cometh the whirl- " wind, and cold out of the north. By the breath of " God frost is given, and the breath of the waters " is straitened. Also by watering he wearieth the " thick cloud: he scattereth his bright cloud, " and it is turned round about by his counsels: " that they may do whatsoever he commandeth " them upon the face of the world in the earth. " He causeth it to come, whether for correction, " or for his land, or for mercy."—Job xxxvii. 5, &c. " He is wise in heart and mighty in strength: who " hath hardened himself against him, and hath " prospered? Who removeth the mountains and " they know not, who overturneth them in his anger. " Who shaketh the earth out of its place, and the " pillars thereof tremble. Who commandeth the

"sun, and it riseth not, and sealeth up the stars. "Who alone spreadeth out the heavens, and tread- "eth upon the waves of the sea. Who maketh "Arcturus, and Orion, and Pleiades, and the "chambers of the south. Who doeth great things, "past finding out, and wonders without number." —Job ix. 4, &c. "Thou didst cleave the foun- "tains and the flood; thou driest up mighty "rivers. The day is thine, the night also is thine: "thou hast prepared the light and the sun. Thou "hast set all the borders of the earth; thou hast "made summer and winter."—Psal. lxxiv. 15, &c. "He causeth an east wind to blow in the heaven, "and by his power he brought in the south wind." —Psal. lxxviii. 26. "He watereth the hill from "his chambers; the earth is satisfied with the fruit "of thy works. He causeth the grass to grow for "the cattle, and herb for the service of man, that "he may bring forth food out of the earth."— Psal. civ. 13, 14. "He giveth to the beast his "food, and to the young ravens which cry."— Psal. cxlvii. 9. "Thus saith the Lord thy Re- "deemer, and he that formed thee from the womb, "I am the Lord that maketh all things, and that "stretched forth the heavens alone, that spreadeth "abroad the earth by itself."—Isa. xliv. 24. "For "thus said the Lord that created the heavens, God "himself that formed the earth, and made it; he "hath established it, he created it not in vain, "he formed it to be inhabited, I am the Lord, and "there is none else."—Isa. xlv. 18. "Remember "the former things: for I am the God, and there "is none else."—Isa. xlvi. 9. "I form the light,

"and create darkness, I the Lord do all these "things."

JAN. 21.

The wonders of the Human Voice

PERHAPS the human voice is the greatest masterpiece of the Creator. It is impossible to fathom its admirable mechanism, whether we consider its principle, its organs, or its variations. We will try silently to reflect upon it. We can utter sounds. What is it that enables us to do so? This faculty seems to depend on the construction of the wind-pipe. When the air we have inhaled is expelled with quickness, the little opening in it occasions a sound. This curious pipe is composed with circular gristles, and these are held together by an elastic membrane. There is a little lid at the entrance, which opens to let out the air. The tones of the voice are modified and multiplied by its opening less or more. It closes when we swallow, in order to keep out the food which has to pass over it in its passage to the stomach. We learn from experience that there are twelve full tones in the human voice, taken in its fullest extent. It was necessary that the wind-pipe should be divided into twelve equal parts, in order to produce this variety. Its two sides, when stretched, are distant from each other the tenth part of an inch; from which we may calculate, that each tone of the voice may be subdivided into an hundred other parts; and further, that a man is able to pronounce two thousand four hundred

different tones, all of which may be distinguished by the ear. But in regard to these surprising properties, we have few advantages over the animals. In this however, we surpass them; we can compress the air, and modify the voice so as to produce letters and words. The lips, the teeth, and the palate contribute much to this operation.

The five vowels have only a simple sound: let us dwell a little on the manner in which we utter them.

We pronounce *a* quite different to what we do *e*, *i*, *o*, *u*; though we pronounce it with the same tone. But the reason of this difference is one of the impenetrable mysteries of nature. The mouth must be more or less opened to pronounce the five vowels, and for this reason the human mouth is differently formed from that of any other animal. Those birds which learn to imitate man's voice, can never pronounce distinctly the several vowels, and hence the imitation must be imperfect. Three or four organs contribute to the pronunciation of consonants; the lips, the tongue, and the palate. The nose indeed has its share; if you stop it, certain letters cannot be pronounced but in an unintelligible way. One of the wonders of the voice is, that no human heart has ever been able to imitate it by any machine. Song, it is true, may be imitated; but the articulation of sounds, and the pronunciation of different vowels, cannot. There is a stop in some organs, called the *vox humana*; but no tones are produced by it, except such as resemble the dipthongs *ai* or *ae*. All the art of man cannot imitate one of our words, which we pronounce with so much ease.

These considerations should again induce us to reflect on, and to praise the ineffable wisdom and wonderful goodness which God shews in the formation of each part of our bodies! May they make us more sensible of the value of the gift of speech, which so nobly distinguishes us from every other animal! How would our happiness be diminished, if we could not communicate our thoughts by conversation, nor pour out our hearts in the bosom of a friend! How lamentable would our fate be, if we were amongst the number of those unhappy persons who from their infancy are deprived of the faculty of speech! We know some of this description; and whenever we see them let it teach us to value our own happiness, and to bless God, who among his innumerable benefits, has given us also the gift of speech. Let us never forget the use we should make of it; for had we a thousand tongues, they ought to be employed in glorifying the Supreme Being, and in instructing and comforting our fellow-creatures.

JAN. 22.

On the duty of collecting our Thoughts in winter.

THOSE who would embrace every opportunity to improve their minds, will gladly be reminded of the obligations they are under of employing their winter days' so as to become days of consolation to their souls. It is easy to shew, that this duty is at once agreeable and advantageous. How would our piety be improved, if each change, each new appearance

in nature, led us to trace it up to that God whose glory is manifest in every season of the year! When we see the earth covered with snow, the lakes, and rivers loaded with ice, the trees barren, and all nature robbed of its glory, let us think of the ends of the Creator in thus ordaining it. We shall discover with a little attention, that all things are planned with wisdom, and that all the laws of nature combine together for the general good. If from our limited understanding, we only can take in the smallest part of God's designs, it should suffice us to know that the snow, the ice, and all the phenomena of winter, tend in the plan of an infinitely wise God to render the earth fruitful, that it may yield its increase for the inhabitants thereof. What numberless objects present themselves for edifying remarks! The snow dissolves, and the ice melts in a moment! How rapid too is the flight of time! Should not this remind us of the shortness of our stay here? We live in a warm room and enjoy all the necessaries of life. Should not these blessings make us consider our poor fellow creatures, who are destitute of food, fire, and raiment. When we reflect on the short space between day and night, we ought also to think on the shortness of life, and the importance of redeeming the time, by wisely improving every hour. Many imprudently expose themselves to danger on the ice: let this remind us of those thoughtless mortals who give themselves up to the pleasures of the world. If it be our desire to mend the heart as well as to employ the mind, every object which presents itself may answer that end; and we shall rejoice at every good thought, or

pious resolution which they awaken in our souls. We should imitate the bee, in choosing the finest and the sweetest flower. The most barren field is rich in sweets to a sanctified fancy. Great good will accrue to us from thus filling up our time: it will controul our hearts which are ever ready to go astray. While some seek dissipation in worldly follies, we may find much nobler and more lasting enjoyments in reflecting on the works of God. What can inspire our hearts with so sweet, so pure a satisfaction, as the raising them above earthly enjoyments, to partake of that pleasure which is enjoyed by the angels and blessed in heaven? What raptures would it afford to find God every where! The flakes of snow as well as the flowers of spring; the cold of winter, as well as the heat of summer, display the wisdom of the mighty Creator! Such rapture far surpasses all the pleasures of this world.

O Eternal Spirit, may thy almighty energy ever assist my feeble heart! I would devote myself wholly to thee; but thou knowest that I am often drawn away by the world, and my soul is hindered from taking its flight towards heaven. Break, I beseech thee, those bonds which still attach me to the vain honours and pleasures of this life; and grant that my soul may rise more and more to thy adorable self! If my life be spent to thy glory, my death will be edifying. Happy shall I be when transported to the heavenly mansions, where I shall eternally improve in the contemplation of thy glorious works! Where, with admiration, I shall trace thy wise and wondrous footsteps; and where, being disengaged from all trifling pursuits, I may draw from the medi

tation of things infinitely more sublime, new motives for glorifying thy holy name.

JAN. 23.

On the Fear of Spectres.

THE ridiculous apprehension of spectres with which many are tormented, renders the long winter nights unpleasant to them. In the dark days of our ancestors, this superstitious fear was more excusable; for their ideas of spirits were more confused, and popery itself had a tendency to engender such fears. But it is wonderful, that in an age so enlightened as the present, such ideas and such fears should exist. It discovers man's ingenuity in raising imaginary monsters, and in tormenting himself. Man often creates fancied evils to himself and becomes unhappy because he thinks himself so. The miser is tormented with the fear of robbers; and the discontented man, from his anxiety about what may happen. This may teach us what human nature is and shew us the necessity of watching over our imaginations. If in the night they deceive us, by presenting phantoms to us, in the day time they often produce illusions, by representing vice as virtue. We should fly from all sin as we should from the appearance of a spectre; but man is bold and rash in the former case, and timid and fearful in the latter. How is it that a groundless fear should so strongly possess some people, who are not the least terrified by much more alarming circumstances? Why should we shudder at the fear of a single ghost, while the

certainty of being transported before long into a world of spiritual beings, makes no impression upon our minds? Thousands remain unconcerned, though they know that every step draws them nearer to the presence of the infinite and eternal Spirit. Should a departed spirit appear to us at midnight, and declare that we should soon join him, the most intrepid person would be filled with terror; he would reflect on the event and anxiously wait the issue. Why then are we so deaf to the voice of God, which loudly cries, "Prepare to meet thy "God?" How inconsistent to tremble when there is nothing to dread, and to rest secure when we ought to fear!

Yield not, O my soul, to vain fears of the night: but dread the eternal God, whose coming will fill the most intrepid hero with dismay, and cause him to cry out, in the bitterness of his soul, Let the rocks and mountains fall upon me, to hide me from my Judge! Let us fear, above all things the displeasure of God. If his fear rule in our hearts, we may boldly say with David, "The Lord is my strength, "of whom shall I be afraid?"

JAN. 24.

On subterraneous Fires and burning Mountains.

THE earth is warmer on its surface than at a little depth into it, because the surface is heated by the sun. Hence the inhabitants of hot countries can preserve ice to cool their drink the whole year. But if we dig fifty or sixty feet deep there is a sen-

sible increase of heat; and if we go to a still greater depth, it becomes so close as to stop respiration, or put out a candle. It is hard to determine what is the cause of this heat. Perhaps they approach nearest the truth, who admit that there are concealed fires in every place under the earth. But it cannot be determined with certainty how this fire, thus closely confined, can burn; what that substance is which feeds it, or how it can be burned without consuming? Of the existence of subterraneous fires, there can be no doubt. There are often terrible eruptions of fire. The mountains most remarkable for them, are Etna, in Sicily, and Vesuvius, in the kingdom of Naples. The accounts given of these two volcanoes are frightful; sometimes only a black vapour rises out of them, at other times a hollow sound is heard; thunder and lightning sometimes instantly succeed, accompanied with an earthquake: the vapour then clears up, and becomes bright. These eruptions are sometimes so violent, that stones and large pieces of rock are hurled into the air, and whirl round like a foot-ball. In the last century, pieces of three hundred pounds weight were thrown into the air, and fell at the distance of three miles. But even these explosions are not always the worst; for at certain times the glassy entrails of the earth boil over, and run in liquid streams for several miles through the neighbouring country, destroying every thing in its passage. This torrent of fire lasts sometimes for several days, wave succeeding wave, till it reaches the sea; and even here it continues to flow for some time, unextinguished in the waves of the ocean! What terror

and mischief do such eruptions occasion? They swallow up whole farms and villages, with their fruitful plantations. It is said that in one of Etna's eruptions, the torrent of burning lava spread itself over fourteen cities, and that the noise within the mountain was heard at the distance of twenty miles.

But why has the Lord created these volcanoes, which spread such terror and devastation on the earth? Who, or what am I to presume to ask such questions? Shall a worm demand of the All-wise an account of the plans he has formed? These volcanoes, however, cannot be the work of chance; and no doubt there are reasons why they exist. Notwithstanding the mischief occasioned by them, it is more than counterbalanced by the advantage they are of to the world. The centre of the earth being full of fire, it was necessary there should be volcanoes, to serve as vents by which the force of that dreadful element is weakened. Earthquakes would be still more violent if volcanoes did not exist. Italy is rendered more fertile by the different eruptions which take place in the mountains; and most likely those frightful phenomena may produce advantages which we know nothing of. Probably their influence may extend to the whole globe. We are certain, however, that they contribute to fulfil the wise and gracious designs of Jehovah. Where we find any thing obscure and impenetrable, let it teach us to put our hand upon our mouth and to say, "O Lord, all thy judgments are right, and thy "ways past finding out! But who would not fear "thee, O Lord, most high, who dost such wonder-"ful things?"

JAN. 25.

On Comets.

COMETS borrow their name from the vapour which surrounds them. No doubt they are of the number of the heavenly bodies which belong to our system. They move round the sun as well as the rest of the planets, but they have a motion peculiar to themselves. They also differ in their orbit, and in their form. They appear uneven and full of spots, when seen through a telescope; but their figure is often concealed by the mist which surrounds them. The size of comets also differs: some are larger than stars of the first magnitude, while others are scarcely equal to stars of the third and fourth. In the midst of a comet is seen a very thick nucleus, which is sometimes separated, and becomes like the edge of the disk. It is not always perfectly round, nor is its light equally strong and brilliant. Its tail or beams keep opposite to the sun, and are of so transparent and thin a substance that the fixed stars may be seen through them. Sometimes those beams extend from the sensible horizon almost to the zenith, which gives to the whole star an appearance of great distinction! The tail enlarges in proportion to its distance from the comet, and its light decreases as its size increases. These remarks result from the exact observations made by astronomers; but how imperfect are our best ideas of these celestial bodies, many of which are far beyond the reach of our sight! Who knows whether the comet be a watery planet or a burning globe? Who can give satis-

factory answers to the following questions? Can that globe be inhabited which, when near the sun, endures all its burning heat, and at other times flying out of the lines of the spheres, plunges into total darkness, where it seems as if the rays of the sun could never reach it? Has the Judge of all designed these comets for the punishment of rebellious creatures? Are they the abodes of perverse beings, reprobated by the Almighty for their sins, and thus by turns exposed to the violent extremes of heat and cold? Perhaps these eccentric bodies may serve one day to divert the course of the planets, and by that mean become the instrument of their destruction. Or are they void and shapeless, as the earth was before the Creator made it habitable? Must our globe be destroyed before the fate of comets be determined? Our inability for answering these questions, ought to convince us that the knowledge of man is very limited. Yet he often loses sight of this mortifying truth. Many people consider a comet as the forerunner of the judgment of God, as ominous of the fate of nations and the fall of empires. Others deem comets as the presages of war, of inundations, or of the plague, in short of the most direful calamities. These people forget that a comet is a natural appearance, and that its return may be generally calculated, and does not therefore interrupt the ordinary course of things. Comets, no doubt have a very different design to what superstition gives them. Can it be supposed that infinite wisdom placed those prodigious bodies in the heavens, merely to announce to mankind the fate that awaits them?

May I view the comet, when traversing the immense space which now separates it from my sight, and its return again, not as a messenger of destruction, but as the herald of the majesty of my God! Adored be that wisdom which prescribes to it its course! which conducts it through the immensity of space, which brings it sometimes near the sun, and sometimes causes it to fly off to the utmost bounds of the planetary system! Whenever it shines over my head, may my soul take a pious flight towards my reconciled Father, who is the arbiter and sovereign of all worlds, and the Saviour of them that believe! Then will I cherish that sublime idea, that I may perhaps soon become an inhabitant of that eternal abode, where I may discover millions of new worlds in the immensity of space.

JAN. 26.

On Snow.

PROBABLY some may be ready to ask, on reading the title of this meditation, Can it be worth examining into the cause of so common a phenomenon? I desire, notwithstanding, to awaken attention to this wonder, and to shew that there are sufficient charms for a reflecting mind in the formation of snow.

Snow is formed of watery particles, which are frozen in the air. A frozen drop of water becomes ice. The difference between snow and it is this; the water of the ice freezes when of its usual density; but the water of the snow freezes when its parti-

cles are still separate, or reduced to vapour. We find, from experiments, that snow is twenty-four times lighter than water; and that, at the time of its falling, it fills up ten or twelve times more space than the water produced from it when melted: this shews that snow must be a water extremely rarified. Snow is not merely water, for the effect it produces, and the construction of its particles are different from those of water and ice. This shews, that there is something very remarkable in the formation of snow.

When particles of collected vapour freeze in the atmosphere, the nitre dispersed in the air unites with it, in the form of small darts, of a hexagonal shape. A great number of these little darts uniting together, the particles of water which are among them grow hard, and take the form of the nitre. This may account for the flakes of six sides, which consist of six points, like small needles, at each side of which smaller darts join themselves; but their form frequently varies, when driven about by the wind. The form of these flakes of snow would appear to us very wonderful, if we were not accustomed to see them annually.

But should we be inattentive to these wonders, because they so frequently occur? Verily no. But we should the more carefully examine them, and incessantly admire the power of God, who is constantly setting wonders before our eyes, and overruling them for our advantage. Is it not astonishing to observe the several forms that water assumes, under the creating hand of the Almighty? Sometimes it is formed into hail, sometimes it congeals to

ice, and sometimes it is changed into innumerable flakes of snow. In all these changes, God shews himself great, and worthy of the highest adoration. Let us no longer look upon snow with indifference. May its form, and the advantages resulting from it, lead us to thee, O God, who made it, and coverest the earth with it! To thee, O Lord, whose wonders are displayed through all nature, in snow, in frost, in hail, and in all things, to thee be everlasting praises, honour, and glory. Amen.

JAN. 27.

On the Rapidity with which Human Life passes away.

How short and transitory is human life! Though this is an incontestible proposition, yet to observe the conduct of most people, one would think it is not a generally received truth. We may judge by our own experience; every step we have taken from our first existence till now, ought to have convinced us of the shortness and frailty of life. With what swiftness have the days, the weeks, the months, and the years passed away! Before we perceived it, they were over. Let us try to recal them to mind, and to follow them in their rapid flight. Can we give an account of the different eras? Had there not been in our lives some very remarkable moments, how should we recollect the histories of them? What can we say of the years of our infancy, childhood, and youth, but that they are gone for ever? During those periods, we had not perhaps either the

wish or the time (as we supposed) to look into ourselves. Our riper age, when we were more capable of reflection, came on: perhaps we then thought it would be proper to act like rational beings, and to change our way of life. But still the cares and business of the world so totally engrossed our minds, that we could find no time to reflect on our past lives. Our cares increased in proportion to our families. Thus old age creeps insensibly upon us, and nothing is done to render the approach of death welcome. The purposes for which God placed us in this world even then are forgotten. But what can insure our ever attaining to old age? Before ever the tender thread of life comes to its full length, it may be broken by a thousand accidents. A fall reduces the tender infant to dust. In the age of bloom and beauty the young man is cut down like a flower, and laid in the grave. Accidents and dangers increase with years: the seeds of many deadly maladies are sown in idleness and excess. The last age is more dangerous still: not half that are born into the world ever attain to seventeen years! This then is the short but faithful history of life.

O may we be taught how to number our days, "that we may apply our hearts unto wisdom!" May we redeem the time that flies so swiftly away! Even while we are thus reflecting, the time runs on. Let us think seriously on it. It is impossible to recall a single instant that is past; but reflecting upon it may become a source of pleasure or of pain. What pleasure does it afford, to be able to look back on our past life, and to say with truth to one's self, "I have lived so long, in some measure to the

"glory of God, and have sown a rich seed of good "works: I would not begin life again, nor do I "regret that it is gone." Let us devote our short space of time to the great interest of eternity, and by the grace of God we hold the above language in the decline of life.

JAN. 28.

On the Frost which is sometimes seen on the Glass of Windows.

THIS small phenomenon shews what variety, simplicity, and order, their are in the least productions of nature. It is admirable to see the extraordinary figures which are presented to us on frozen glass: yet we seldom pay that attention to it which it deserves. It has its principle in the fluidity of fire. In going through glass, it leaves on the inside, and near any openings, those particles of water and air to which it was united, Thus it is formed into a cloud, which thickens in proportion as the fire goes out of it, till there is not enough remaining in the room to preserve the fluidity of the particles of water on the glass: then they congeal, and the nitre in the air mixed with them, produces that variety of figures with which the glass is covered. The sketches of these figures are formed by very small threads of ice, which keep uniting till the whole glass is covered with a coat of ice. The origin of all the figures is in these threads; and the first weaving of them may be distinctly seen. At first some lines, exquisitely fine, appear; and out of those proceed small thread

which in their turn bear other branches. In a hard frost, when the first coat of ice grows thick, it produces the most beautiful flowers, and lines of all sorts; some of them straight, and others spiral. Perhaps this great variety of figures does not proceed altogether from the air, and the particles of fire, but also in some measure from the imperceptible cavities there are in the glass.

But whatever be the cause of this phenomenon, it is clear that this sport of nature discovers great art, united with great simplicity. Perhaps some readers may think this subject altogether trifling, but it appears to me, that small things of this kind are to be preferred to those which often fill up our time. With what trifles, what nothings, are we sometimes amused! We shall think differently, if we lay aside the childish ideas we often form of the works of nature. Where ignorance discovers nothing remarkable, we shall often find masterpieces of divine wisdom: by this nature's works are distinguished from the works of art. Can any object be too trifling in reality, if it furnishes us with a subject for useful reflections? I have no objection, for my part, to read on frozen glass a truth which may conduce to my happiness. View the figures that the frost has formed upon the glass; they are various; they are beautiful! but a ray of the meridian sun effaces them. Thus it is that fancy often paints every thing to us in the fairest colours, but they are nothing but fine images, which disappear by the light of reason and religion. If this wise lesson be regarded, it will reward us for our trouble in attending to the little phenomenon that produced it.

Jan. 29.

On the Use of Bread.

Bread is the most common and the most wholesome of all the food which our beneficent Creator has given us for the support of life. At the delicate table of a prince, it is as necessary as at the table of the labourer. It is of great use and importance, both in sickness and in health. It appears to be designed as the principal food of man; for the plant which produces it will grow almost in any climate, and it is difficult to find an inhabited country, where wheat if properly cultivated, will not ripen. Though we eat bread every day, we do not tire of it, which is an evident proof that we cannot do without it. If we make too frequent use of those costly and dainty dishes, which pride and luxury have invented, they soon cease to please our palates; but we always eat bread with pleasure: and the man who has made it his daily food for seventy years, still relishes it, though he may have lost his taste for all other food. Ought we not then daily to look up to God, as we eat bread, and to praise him for granting us this blessing? If we would choose the best food, can there be any more natural, more wholesome, and more nourishing than bread? It refreshes more than the smell of the most precious aromatics. They may indeed fly more to the head, and be more heating; but even the smell of good bread, though simple, may serve to convince us that it contains what is essentially proper to form and repair the nervous fluid. Its quickly dissolving

when moistened, shows its nutritive quality, and that it is easy to digest. We may here reflect on the visible care of the Creator for our health in appointing us this food. Bread is the best adapted to resist corruption, which our best juices are liable to. It has an acid quality in it, and is an excellent preservative against putrefaction. We are certainly unworthy of the bread that daily feeds us, if we be insensible of its being a blessing granted to us from God. Surely we should love and adore that kind Father, who causes the earth to produce bread for our support. What! shall we, like brutes, receive our food without thinking of him from whom it comes? Surely not. Is it not enough that we receive our food in our infancy, without being able to express our gratitude for it? O God! now I know the hand that supports me, let me ever adore thee for it. Help me to prove the sincerity of my gratitude, by sharing the bread which I possess in abundance with those who are in want! Many of thy dear children possess much less, though they deserve more than I. They are pinched with hunger, while I have enough and to spare. Lord, it comes from thee, and I would share it with my fellow-creatures, who have the same natural right to thy favours.

JAN. 30.

On our Duty in regard to Sleep.

ONE melancholy remark we have often occasion to make is, that most people lie down to sleep with an inconceivable security. If we consider it only

as it relates to our bodies, the revolution which sleep produces ought to appear to us of great consequence: but if we consider it in another light, were we to form to ourselves all that might happen to us when asleep, it is clear to me, that we could not close our eyes without putting ourselves under divine protection. But, upon the whole, it is no wonder that those, who, when awake, are so inconsiderate and so negligent of every duty, should be the same in that which relates to sleep. Let the reader, however, consider in what way he may glorify God, and always act, in all respects, as becomes the character of a real Christian. What praises do we owe the Creator for the blessing of sleep! Some, indeed, cannot estimate the worth of sleep, because they do not know the want of it; but how soon may they be deprived of the sweet repose, by sickness, fear, sorrow, or old age! Then they would confess that sleep is one of the most pressing wants of nature, and, at the same time, an inestimable blessing of God. But ought they to wait till they lose this blessing before they become wise! Certainly not. While they enjoy it, and feel each night its salutary effects, never let them throw themselves into its arms without a lively sense of gratitude to their heavenly Father. It is always wrong, through idleness, to prolong the hours designed for sleep. Nature is generally content with little: and seven or eight hours of uninterrupted repose is as much as is necessary. When men, through avarice, ambition, or any other motive of that kind, break their rest and necessary sleep, they are perhaps more culpable than those who give themselves up too much to

it. We act in both cases contrary to the rules established by our Creator, and contrary to the gratitude we owe him for so great a blessing.

We ought, above all things, to endeavour to go to bed with a proper turn of mind. How should we act, if we were certain we should pass from the arms of sleep into those of death? Surely we should recollect our past life, and seek through Jesus Christ, the pardon of all our sins. Well then, we ought every night to consider, "This possibly may be "the case." It is computed that fifty thousand people die every night. Who knows that his name is not in the list of those whom death may transport to-night to another world? I leave it then to the decision of every reader what they will do, if, in the midst of their sleep, they should be called upon to appear this night before the tribunal of the adorable Jesus? If God should call us in the course of this night, are we prepared to appear before him? O God! thou knowest the hearts of all men; nor can we hide any thing from thee. We feel our weakness daily. We beseech thee to pardon all our sins, that we may stand before thee with acceptance, through Jesus Christ our Lord. Amen.

JAN. 31.

The constant Revolutions in Nature.

WHEN God brought the universe from the depths of nothing, he established invariable laws, which should influence all the constant vicissitudes of nature. The same variations and the same effects

at certain periods, have been seen in the sky and on the earth for near six thousand years. The sun, moon, and stars have never deviated from their prescribed course. But who supports and directs them all? Who prevents them from losing their way in the immense space of the heavens? These, and a thousand such questions, lead to God. He appointed the circles they were to describe; he supports and guides them; he prevents them from dashing one against another. They move with incredible velocity, and with such perfect order, that nothing can disturb them.

There are also continual revolutions nearer to us in the elements, though they are not seen by common observers. A perpetual motion agitates the air and sea. The rivers run into it, and from its broad surface arise vapours, which produce clouds to pour rain, hail, and snow upon the earth. Thus the water which falls from the clouds returns back again into the sea. The seasons succeed each other according to the order at first established. The fertile earth produces annual fruits; yet it is not thereby exhausted: for, by a continual circulation in all the nutritive parts, whatever comes from the earth is faithfully restored to it again. The same circulation takes place in the bodies of all animals: the blood continually flows through all its channels, and distributes to all the members the nourishing juices they require; after which it returns again to the heart, from whence it came. These revolutions should lead us to reflect on the Supreme Being, who fixed their laws at the creation of the world. By his wisdom and power, he has also directed them

to this very moment. These reflections are worthy our attention at all times, and particularly proper at the close of this month. All the changes which have taken place in the course of this month, have been under the direction of a particular Providence, and are wisely adapted to accomplish the designs of God.

The sun has cheered us each day, and after having fulfilled its designs, has again given place to the night. The goodness of God is daily renewed to us: he makes all changes and revolutions contribute to our welfare. This month, with all its days, hours, and minutes, is for ever gone! and all the wheels of the great machine of the universe will stop at last, and the springs of nature will be broken! Days, and months, and years, will all be lost and swallowed up in the abyss of eternity! But thou shalt exist, O eternal, unchangeable, and infinite BEING, and by thy power shalt eternally prolong my existence!

FEB. 1.

All things tend to the good of Mankind.

It is impossible we should be too sensible of the love by which God has so advantageously distinguished us from other creatures. Man may be considered as the lord of the creation, and in some measure the centre of all which God has produced for the manifestation of his glorious perfections. All nature acts and labours for us, in the waters, the air and the earth. To serve our purpose, the horse's

hoof is furnished with that horn, which it would not want, were it not to draw burdens and to climb the mountains. The silk worm spins her bag shuts herself up in it, and afterwards leaves her curious web for our use. The gnat lays its egg in the water, which serves for food to those fish which are designed for man's support. The industrious bee gathers her delicious sweets from the leaves of flowers, for our use. The ox ploughs for us, and desires no other reward than a little food. For us also the fields, the forests, and the gardens, abound in wealth. The rich treasures which the mountains contain, are likewise intended for the use and benefit of man. Certainly we have many more wants than the brute creation; but we have a capacity also to make all things around us subservient to our use and pleasure. An endless variety of creatures contribute towards our food, clothes, habitation, and happiness. In order that man may have plenty of what is most agreeable to his wishes, God was so ordered it, that those things which animals require, are generally such as man could make no use of. But God has procured us a thousand other enjoyments besides our food. He has directed the lark and the nightingale to delight us with their song. For us the flowers perfume the air, and the fields and gardens are covered with beauty: and, above all, God has given us reason to rule the animals, to subdue the lion and the whale, to take pleasure in his works, to contemplate the magnificence, the beauty, and the greatness of them, to admire their harmony and order, and, in a word, to turn all things in nature to our advantage. Thou art, O man! so endowed and loaded with benefits,

that thou never canst be grateful enough to thy heavenly Benefactor: our love to him can never bear any proportion to his love to us. To increase our love and gratitude more and more, let us frequently think of the boundless liberality of our heavenly Father, on the preference with which we are honoured, and on the innumerable blessings we are constantly receiving from him. There are no creatures upon earth so highly favoured as man. Let us survey all nature: let us look upon the sky, the earth, the sea, and let us ask whatever beings exist in them, and they will tell us that we are the happy beings, to whom all others are subservient, and for whose use they were intended. Under these considerations, may our souls be penetrated with the most lively gratitude, the most ardent love, and the most constant praise to our glorious Benefactor. Let it be our constant study and ambition to live for him alone, who has given us life and all the enjoyments of it. We ought to form such resolutions in his strength, in the beginning of this month. We shall have daily reason to acknowledge his paterna. care. Let us taste and enjoy the divine goodness in all things provided for our support.

Above all things, let us praise God for redeeming love; for a hope full of immortality! For us Christ died upon the cross; for us he pleads above; and for us he designs that happiness, which all the faithful will enjoy about his throne. All the blessed spirits will be our friends and companions; and with them shall we partake of those joys, which infinitely surpass all others. In the world we now inhabit,

all pleasures are mixed with pain, and perfect happiness can only be found in heaven above.

Feb. 2.

On the influence which Cold has upon Health.

In the severe winter months, it is very common to hear the other seasons of the year extolled. We then extravagantly cry up the spring, the summer, and the autumn; when their advantages can no longer be enjoyed: but while we possess them, we are too insensible of their value. This is the disposition of man. The blessings he possesses he does not value as he ought; nor does he know their worth till he is deprived of them. But is it a fact, that those three seasons only merit our attention? Is winter really an enemy to pleasure, and destructive to health? To obviate such a prejudice, let us think impartially on the advantages which winter procures for us in regard to health.

The sudden changes of the weather in spring and autumn are often destructive to health. The air in summer is filled with corrupted vapours, or at least with such as are disposed to be so. In those seasons we are liable to take cold, which is often attended with fatal consequences. Winter has few of these inconveniences. The cold favours insensible perspiration, and by that mean prevents many terrible evils produced by its being suppressed. The blood purifies, and we feel lighter and easier by means of a gentle perspiration; it also increases the appetite,

and promotes the cheerfulness and serenity of the mind. Many inconveniences arise from the great heat of summer. What oppression and weight we often feel when obliged to be long in the open air, and to endure the weight of a burning atmosphere! We long for the coolness of night, to revive us and to restore our strength. These inconveniencies are not attached to fine winter days: when we have more courage, strength, and activity, and are better disposed for labour or pleasure. Cold increases our spirits, excites us to quicker motion, and to take exercise, in order to put us in a gentle heat. Even winter may thus contribute to our pleasure and health. God has formed the wisest plans for the preservation and happiness of mankind, in every month of the year. If we do not enjoy as good health in winter as in the other seasons, and if we are not equally content, it is in some measure our own fault. Some pass the winter in idleness: they shut themselves up in hot rooms, and never breathe a pure air, nor take exercise in the fine days of winter. Some are over-burdened with anxious cares, or are intemperate in the use of earthly enjoyments. If men followed the laws of nature, how happy might they be, and how good their health, if they allowed labour and rest, business and pleasure, regularly to take their turns!

O adorable Creator! I confess with gratitude the wisdom of all thy designs. I adore thy fatherly care, with which thou providest for my preservation, peace, and happiness, in all the vicissitudes of the year. Suffer me not to make, by my own imprudence, a season painful and unpleasant, which

might otherwise become the source of the purest and most innocent delights. Suffer me not, in the levity of my mind, to destroy that health and life, which thou hast given me; but may I rather devote them to thy service and glory, that I may answer thy wise and beneficent views. Thus shall my days pass on with comfort, and end in peace.

Feb. 3.

A Temperature always the same would not be good for the Earth.

We are ready to think that our world would be a paradise, if in all places and climates there were an equal distribution of heat and cold, the same fruitfulness, and equal day and night. But if things were so ordered, that in every part of the globe there was the same degree of heat and cold, is it certain that we should gain by it in regard to convenience, food, or pleasure? So far from it, that the earth would become a most miserable place to live in, if the Creator had followed the plan we would wish to prescribe. But now there is an infinite variety in the works of God. The earth would appear a dull, uniform mass, would lose much of its beauty, and many of its charms, if the revolution of seasons, of darkness and light, of heat and cold, were not to take place. A great many plants and animals could not exist. Many creatures found in these cold climates, would be unable to bear the opposite extreme; while, on the other hand, hot climates are peopled with beings, who would perish in cold ones,

Were there an equal degree of heat in all places, a number of natural productions could not exist. Nature would lose many of her charms with her variety; and many blessings would become useless to us. Did all countries produce the same things, and had they all the same advantages, commerce would cease, and all communication between different nations would be at an end. What would become of many arts and sciences, if the mutual wants of different countries did not oblige them to communicate with each other? But suppose there were an equal degree of heat and cold throughout the world, could we determine what the degree of heat ought to be? Should it be every where as hot as in the torrid zone, who then could bear such a climate? But suppose there were a temperate heat over the whole earth, which would suit all creatures, the air must likewise be every where of equal height, density, and spring. Hence it would follow, that the earth would be deprived of one of the principal causes of the winds, the want of which would occasion inexpressible mischief. That air which is so essential to our existence, would become the worst of poisons, were it not purified by the winds. Sickness, contagion, and death would soon follow, and our fancied paradise would become an inhospitable desert, a real chaos!

Wise and beneficent Lord, thou hast done all things well! The more I think of thy wonderful works, the more this important truth is impressed upon my mind. Whenever I see any thing that may appear to me faulty, or imperfect, I would call to my mind thy infinite wisdom, and the weakness

of my understanding. All things, however they may appear to us, are arranged with wonderful wisdom and goodness; and the more our minds are enlightened, the more reason we shall see to praise and admire the perfections of the Creator. However insensible I am of his wisdom and goodness, all that he does is right.

I would form the same judgment also of the moral government of God, and his conduct towards all intelligent creatures. His dispensations towards them differ, and he has not regulated their fate all alike; but it is in this as it is in nature, his ways are all ways of wisdom and goodness. As our globe could not subsist, if there were an equal degree of heat and cold every where, so the happiness of the world would be entirely destroyed, if there was a perfect equality in the state of mankind.

FEB. 4.

On the Use of the Stars.

THE starry heavens are an admirable scene of the wonders of God, in the eyes every one who loves to reflect on his works. An attentive observer of the works of nature, must deem the order, the greatness, the multitude and the brilliant splendour of those heavenly bodies a most pleasing spectacle. Supposing we knew nothing of their nature and use, the sight of the stars alone would be enough to fill the mind with admiration and delight. Can any thing be more magnificent and beautiful than the immense expanse of the heavens, adorned with num-

berless lights, which the azure sky makes appear still more brilliant, and which all differ from each other in size and lustre ? Would a Being, infinitely wise, have thus adorned the vault of heaven with so many bodies, and of such an immense size, merely to please our eyes, and to afford us a magnificent sight ? Would he have created innumerable suns, merely that the inhabitants of this little world might have the pleasure of seeing in the sky some bright specks which are but seldom observed, and the nature and purpose of which are but little known ? Nobody can form such an idea, who considers that there is throughout all nature a wonderful harmony between the works of God and the purposes he designs them for, and that in all things he intends the advantage, as well as the pleasure of his creatures. God has, beyond all doubt, in placing the stars in the sky, had much higher views than that of exhibiting to us an agreeable scene. We cannot indeed precisely determine every particular end the stars may answer, but it is easy to believe that they are intended for the advantage, as well as the ornament, of the world. The following considerations may be sufficient to convince us of this : there are some amongst the stars that are easy to be distinguished : there are others which we constantly see in the same part of the sky, and are always over our heads : these serve as guides to travellers by land and sea in the darkness of the night. By them the navigator finds his way, and knows when he may undertake his voyage with more safety. There are other stars that vary their aspect, and though they maintain the same relative situation, the order of their diurnal rising

and setting is changed in respect to us. Even these regular changes are of great use to us: they serve as settled rules to measure and determine time by: the return and end of the season is precisely marked by the regular revolutions of the stars.

Though the earth derives considerable benefit from the stars, that is not the only, or the most important object which God had in view in forming so many prodigious globes. Can we think for a moment, that the all-wise God strewed so many millions of worlds and suns in the immense expanse, merely to measure time, or to mark the return of seasons! Beyond all doubt, these innumerable worlds are for more sublime purposes, and have each its particular destination. The fixed stars, being so many suns which can give light, animation, and heat to other worlds, is it likely that God should have given them that faculty for no purpose? Would he have created stars, whose rays can never reach us, without having produced planetary worlds to enjoy their benign influence. This world, which is a mere speck, God has filled with living creatures; must we suppose then that the stars are mere desert worlds? Certainly not. Probably each of these fixed stars which we see by myriads, has its worlds moving round it, for the benefit of which it has been created; and those worlds may serve as abodes for different sorts of creatures; may be peopled, like our earth, with inhabitants, who praise and admire the magnificent works of the Lord. Possibly from all these globes, as well as from ours, prayers and hymns of praise may arise continually towards the Creator.

Though these are only conjectures, yet to every one that loves God in truth, these conjectures afford an agreeable pleasure. How sublime is the thought, that besides the small number of rational creatures who inhabit this globe, there are perhaps innumerable multitudes of them in those worlds, which appear to us but luminous specks! Doubtless the empire of the eternal is not bounded by the limits of our globe; for great as it is, it bears no comparison to the vast creation. Blessed spirits without number, who magnify the name of our great Creator; and who are all as happy as their destination admits of, exist beyond its bound, and, perhaps, like us, aspire to a better world.

FEB. 5.

The wonderful formation of the Eye.

ALL the works of man's industry are infinitely surpassed by the eye. Its formation is the most wonderful thing that the human understanding has been able to acquire a knowledge of. No artist, however skilful, could imagine a machine of that kind which would not be much inferior to what we observe in the eye. However industrious or sagacious, he could contrive nothing which would not have the imperfections necessarily belonging to all human works. It is true, we cannot clearly perceive the whole art of divine wisdom in the formation of this fine organ; but the little we do know, is enough to convince us of the infinite wisdom, goodness, and power of the Creator. What most con-

cerns us is, to make use of this knowledge to magnify the name of the Lord.

The disposition of the external parts of the eye is admirable. How are our eyes intrenched, how are they defended! Placed in the head at a certain depth, and surrounded with hard and solid bones, they cannot easily be hurt: the eyebrows likewise contribute much to the safety and preservation of this organ. The hairs which form an arch over the eyes, prevent dust and sweat from falling into them from the forehead. The eyelids form another security, and by closing in our sleep, they prevent the light from disturbing our repose. The eyelashes add still to the perfection of the eyes: they break the force of the light, which might offend us, and guard us from the smallest dust, which might otherwise injure the sight. The internal make of the eye is still more astonishing: the whole eye appears to be composed of coats, of humours, of muscles, and veins. The exterior membrane, or tunica, which is called cornea, is transparent, and hard enough to resist the roughest strokes: under this there lies another, which they call uvea. This is circular and coloured; there is an opening in the middle of it, which is called the pupil, and which generally appears black. The crystal is behind this opening, and is perfectly transparent: it is of a lenticular figure, and composed of several small flakes, very thin, and set one over the other. Underneath the crystal is a most transparent substance, which is called the vitreous humour, because it resembles melted glass. The cavity between the cornea and the crystal is filled with a moist humour, liquid as

water, and for that reason called the watery humour. When it is run out it can recruit itself again. The eye is moved on all sides by six muscles, admirably well placed. They raise it, lower it, turn it to the right or left, obliquely, or round, as occasion requires. What is more to be admired, is the retina, a membrane, which lines the inside bottom of the eye. It appears to be a web of small fibres, and very fine, fastened to a nerve which comes from the brain, and which is called the optic nerve. The vision is formed in the retina, for the objects paint themselves at the bottom of the eye on that tunica; and though the images of outward objects are painted upside down on the retina, they still appear in their proper position. The extreme minuteness of this picture is wonderful; for the space of above eleven hundred yards, when it is represented in the bottom of the eye, makes no more than the tenth part of an inch.

I praise thee, O Lord God, for having formed my eye in so wonderful a manner! I have not hitherto considered the gift of sight as I should have done, i. e. as a masterpiece of thy hands, and as a convincing proof that even the most minute parts of my body are the works of God, and not of blind chance. Lord, I see something of the wonders of thy wisdom; and am struck with astonishment when I only reflect on myself—more so when I consider thy various works! Pardon me, O wise and Almighty Creator, if, while I have used my eyes, I have not thought of thee with the warmest gratitude. Dispose me by thy Spirit to remember thy blessings with grateful joy. May I never use

my eyes, but for the purpose for which they were designed! May I employ them in examining thy word and works; and whether I contemplate the heavens or the earth, myself or the sacred volume, may I be induced to bless and praise thy wonderful goodness. When I behold the miseries of many of my fellow-creatures, let not my eyes refuse them tears, nor my heart be shut up to compassion: thus may I fulfil the views of thy goodness, and render myself worthy of thy approbation.

FEB. 6.

On Fogs.

THE fog is composed of watery and sulphureous vapours, which fill the lower region of the air: cold is the principal cause of this condensation; and in order to form fogs, the air must be much colder than the earth, from whence continual exhalations arise. Fogs shed a gentle moisture on the earth, and afford an agreeable sight. Which ever way we look, all objects appear to be confusedly wrapped up in a grey curtain: we see nothing around us but a dark mist, and the eye wanders in all directions, without being able to distinguish objects. The rising sun appears to labour a long time, before he is able to pierce through, and restore to the earth its former appearance. At last these vapours are dissipated: sometimes they fall upon the earth, and sometimes they are carried into the middle region of the air. By degrees the surrounding objects rise out of obscurity, and put on their usual appearance: the

sky again becomes bright and serene, and it is only near the ground, or on the roofs of houses, that any traces of the fog remain, which had for several hours covered the horizon. When I view this meteor, I recollect those unhappy times, when the sciences were wrapped up in an impenetrable mist of ignorance and superstition. Whole provinces were plunged in thick darkness, before the Sun of Truth could shew itself in all its splendour. So shortened and limited was the human understanding, that it scarcely comprehended the things which immediately surrounded it; and such was the power of error, that no ray of light could penetrate the dark shade of prejudice and superstition. At length, however, the sun appeared again, and suddenly whole countries were enlightened, which for ages had been buried in thick darkness: then men learned to distinguish truth from error. A happy futurity, yea, eternity itself was opened to them, and they began to feel the greatness of their condition. This is what thou hast done, blessed Luther! Blessed will be thy memory to all generations!

Notwithstanding this, it is but too true, that as long as I remain in this world, I shall walk in darkness: I cannot at present, by reason of surrounding mists, have a clear and distinct view of futurity. The darkness of the present state is increased by ignorance, prejudice, and credulity: may they soon be dissipated! In this dark vale may the light of divine truth enlighten me! Thanks be to God, I see through surrounding shades a new and living way that leads to eternity: soon shall every cloud vanish, and I shall be brought into a world of light and joy,

which no shades can ever darken. "What I know "not now, I shall know hereafter;" the now incomprehensible ways of Providence will all appear wise and good: there shall my soul, while it overflows with admiration and gratitude, behold the wonderful chain and perfect harmony which there is in all the works of God.

Feb. 7.

On the Tides.

More than half the surface of the globe is covered with water, which we call the sea, as distinguished from lakes and rivers. The latter are more or less filled, according to the different seasons: whereas, in the former, there is always the same quantity of water. The sea is observed, however, to increase and decrease twice every day, according to certain laws. When it rises to a certain height at any port, it soon begins to decrease, and continues to do so for six hours; then the sea is at the lowest ebb: it begins to flow again at the end of six hours, and this increase lasts for six hours more, at the end of which the sea has attained its greatest height. In the space of twenty-four hours, the sea rises and falls twice, and is alternately at the highest and lowest ebb: this alternate and regular motion of the sea is called the flux and reflux. It is called the flux, when the sea rises and swells towards the coasts: and the reflux, when the waters fall back towards the main. It is to be remarked, that the tides are principally regulated according to the

course of the moon: thus there is a greater flux at the new and full moon than at the quarters. There is likewise a more considerable motion in spring and autumn than in the other seasons. During the solstices, the tides are much weaker. This is particularly the case in those seas, where the water fills a great space, and is less observable in more limited seas, such as the Mediteranean. Observe likewise, that the interval between the flux and reflux is not precisely six hours, but it is about eleven minutes more: consequently these revolutions do not happen at the same moment the next day, but near three quarters of an hour later. At the end of about thirty days (the time from one new moon to another) they return at the same hour. Hence we may certainly conclude, from this regular phenomenon, that the tides have some connection with the motions of the moon. But not to search deeper into the cause of this effect, nor decide whether the flux and reflux are owing to the pressure of the moon on the waters, or the gravitation of the particles of the earth towards the moon, let us turn our thoughts to the views which God prepare in these remarkable revolutions. It is a pardonable ignorance not to be able perfectly to explain the laws and course of nature, but it is inexcusable not to reflect on the happy effects which those laws and wonderful phenomena have upon our earth, or to forget what we owe to the beneficent Creator of the universe. One great advantage we have from the flux is, the sending back the waters into the rivers, by which they become deep enough to convey to the gates of large cities burdens and merchandise, which

could not otherwise be conveyed. Sometimes the ships wait the advantage of an increase of water, to gain the road without touching the bottom and so pass on in safety. This important service being done, the tides fall, and leaving the river to return to its shores, they facilitate the enjoyment of necessary commodities to the inhabitants. Another advantage arising from the perpetual motion of the waters is, to prevent them from stagnating and corrupting by lying still. Though the wind contributes to this motion, yet as there is often a perfect calm in the water, there might result from it a putrefaction in the bason of the sea, which, as a grand reservoir, receives all the waters that run from the earth; therefore God has ordered the flux and reflux, to prevent what is hurtful from settling there. Corrupted vapours are separated and attenuated by the motion of the water; and to preserve the sea in its purity, the tides mix and disperse the salt, of which it is full, and which would otherwise sink to the bottom.

By these reflections, we are naturally reminded of a circumstance, which is closely connected with this phenomenon: our life resembles the tides, in its increase and decrease. All things are mutable; worldly joy, hope, or happiness are short lived; we are carried down a rapid and inconstant river: let us take care we be not drawn into the abyss: let us strive hard to gain the smiling shore: let us also bless God that the troubles of life are of short duration. While our happiness cannot be constant and perfect, why should our grief be long and excessive? A mixture of pleasure and pain certainly has its use,

If through the whole course of our lives we enjoyed an uninterupted happiness, we might easily grow proud and forget God. On the other hand, a continual train of evils would be apt to sink our spirits and harden our hearts. We ought then to bless our heavenly Father, for his gracious and wise decrees; and to endeavour to conduct ourselves, through all the vicissitudes of life, in a manner worthy our faith and hope of everlasting life.

Feb. 8.

The Sun does not always appear.

The sky is not always covered with clouds of rain and snow: they are often dispersed, after having distributed the waters they had collected. The most agreeable serenity then appears in the sky; every creature is revived, and filled with joy and animation by the sight of the sun, whose brightness had been concealed for some days by thick and dark clouds. We are favoured during summer with the presence of this beautiful light; but as in winter it seldom appears, and then only for a few hours, we learn better to estimate its worth. The same remark may be made in regard to every other gift of God: we are too insensible of their value, while we have them in our possession. Friendship, health, an easy income, and a thousand blessings beside, which we daily enjoy, do not appear to us so great as they really are; and we often have to learn their value by their loss. We must be laid on a sick bed, deserted by our friends, in poverty and want, before

we can fully feel the happiness of enjoying good health, of having kind and faithful friends, and the means of a comfortable subsistence.

When the sun, after having been long darkened by clouds, brightens up, the earth still looks dismal. Certainly it is a little improved by its rays, but cannot all at once be restored to its beauty. The sun as yet has not sufficient power to conquer the cold, by which the earth is hardened, nor to revive languishing nature. Thus the light of the mind does not always warm the heart; those who languish in affliction and misery are sensible of this. Sometimes it happens, that in the winter of life, or in circumstances of adversity, we see pleasure and joy at a distance, without being able to taste the fruits of either. Much praise, however, is due to God for those gleams of joy, which now and then soften the cares and sorrows of life, and yield refreshment to our minds. There is one favour, O God, which I earnestly beg of thee:—If some of my latter days should be gloomy and sad, I will not murmur at it, nor lose courage; only grant that my soul may now and then be revived by thy divine smiles, and that I may feel some rays of joy, and have a distant view of a happy immortality: this is all I presume to ask, and this will enable me to support with courage the cloudy days of adversity. In winter, how uncertain is the serenity of the sky! how little are the beneficent rays of the sun to be depended on! Now it appears with mild majesty, but soon it will be covered with clouds: perhaps, ere it gains the meridian, it will lose all that splendour and beauty, with which it enlivened the earth this morning. Just such is

the uncertainty of every scene through life: never can we promise ourselves lasting and uninterrupted happiness. This should make us wise and prudent in the days of prosperity, and moderate our desires after earthly enjoyments. Every thing, except pure and undefiled religion, is liable to change: that alone can bear us up under the vicissitudes and distresses of this world, till we come to those blessed regions, where we shall be perfectly and eternally happy, in the full enjoyment of God.

Feb. 9.

On Earthquakes.

The earth is liable to two kinds of shocks: one is occasioned by the action of subterraneous fires, and the explosion of volcanos. These commotions are only felt a little before an eruption, and then only at a small distance. When once the matter, which forms the subterraneous fires, begins to ferment and blaze, the fire makes an effort on all sides, and if it does not find a natural and easy vent, forces itself a passage, by tearing up the earth: this kind of earthquake only extends for a few miles. Like the explosion of a magazine of powder, it shakes the earth, produces a shock, and the commotion is felt for some leagues: but there are other earthquakes, very different, both in their causes and effects. Those terrible earthquakes, I mean which are felt at great distances, without producing any eruption or volcanos. These have sometimes been

felt at the same time in Germany, France, and England. Their length is far more extensive than their breadth. They only shake a zone, or chain of land, with more or less violence in different parts; and they are mostly attended with a hollow noise, resembling a heavy carriage passing rapidly along. The cause of this sort of earthquakes may be explained by the following observations:—All matter that is inflammable, capable of explosion like powder, produces a great quantity of air. The air which fire produces is so much rarefied, that it must cause very violent effects, when it has been long compressed and pent up in the bowels of the earth. Suppose then that at two hundred fathoms deep, there should be sulphureous matter, which should take fire by means of the air, it must naturally seek a vent; but if it find none, it must occasion the most violent shocks. Words cannot express how fatally dreadful those earthquakes are. No desolations, no catastrophes upon earth are so dreadful, so formidable, and so destructive: and what adds to the calamities that attend them, they baffle all human prudence and foresight. When rivers overflow their banks, swallow up provinces, and sweep away whole villages, still there is some resource: possibly the inhabitants may escape to the mountains, or on the tops of houses—not so in earthquakes. One may escape almost any other danger. Whole towns and provinces were never consumed by lightning. The plague, it is true, may depopulate the largest cities, but does not entirely destroy them; whereas the calamity of which we speak irresistibly

extends itself over a whole country, and swallow up kingdoms and people, without leaving the smallest vestige behind.

Who can stand before thee, Lord God Almighty, when thou art angry, or when thou displayest thy power! When thou risest to judge the nations, who can resist thee? Before thee the earth trembles, and is shaken! When thy anger is kindled, the foundations of the mountains are troubled and quake, the mountains tremble, and the hillocks vanish away for ever. At thy presence, the earth and its inhabitants fear and quake. Like fire thine anger spreads, and rocks are split asunder before thee. Who would not fear thee, O Lord God? We acknowledge and adore thy sovereign majesty: though thy judgments are incomprehensible, yet thou art righteous and good in all thy dispensations. Even when the Lord's judgements are abroad in the earth; when in the height of his anger he consumes whole countries; even then his ways are full of wisdom and goodness. Earthquakes ought not to be viewed merely as instruments of God's vengeance; he needs not employ all the strength of nature to reduce mankind to death: a breath of wind would answer that purpose. They may serve in the plan of the Creator towards the general preservation. Let us be convinced that every thing terrible and frightful in nature, all apparent evils, are necessary for the preservation of the whole, and tend to the glory of God.

Almighty and adorable Being! I will bless and adore thy name, even when thou sendest thy plagues, and scatterest terror and ruin on the

earth: even then I will rest with unshaken confidence on thy paternal care. Though the world itself should be destroyed, though the mountains should be removed, and be carried into the sea, thou shouldest still be my support, my all in all! May I possess a good conscience; and though all nature should shake around me, nothing shall be terrible to me! The earth may open under my feet, the world may be wrecked, I shall say with confidence, God is my rock and my defence, and his mighty hand shall be my eternal support.

FEB. 10.

God's established order in regard to the Life and Death of Man.

THE most exact and wonderful order is observed by my God, in regard to our life and death: neither has any dependence on blind chance, but, on the contrary, both are regulated and measured in the wisest manner. We shall find, if we make our calculation of a certain number of years, that there dies a proportionable number of men at every age of life. There are annually more in proportion born than die; so that if ten die, we may reckon that twelve are born. God discovers great wisdom in regard to the several ages of those that die:—In the first years of life, out of three or four children there generally dies one; at the age of five years, one out of twenty-five; one out of forty, at seven; one out of a hundred, at ten; at fifteen, one out of two hundred; at twenty years old, it is much the

same as at fifteen. Mortality increases after twenty-five: there dies one out of an hundred, at thirty one out of fifty, at thirty-five, &c. Here we see the divine wisdom, in sparing young people the most. In what admirable proportion he takes them out of the world! Out of a thousand who die, there is a pretty equal number at the age of twenty, fifty, sixty years. Certainly the manner of life that men lead, their vices, bloody wars, and epidemical diseases, carry off some years more than others. But providence, even here, has taken care to set bounds to mortality in the succeeding year, and to repair the loss which in such case is sustained. Add to this, that every season of the year is not equally dangerous to mankind. The greatest number is carried off in the spring; and the charming month of May when all nature seems to revive, is more destructive than March or April. But disorders sensibly diminish when the heat increases in the month of June. Summer and autumn are more favorable to health than winter.

How admirable is the providence of God, and his tender care for our preservation! He has numbered the days and years of the lowest beggar, and of the child upon the breast. Our births, as well as our deaths, are exactly determined. How tranquil then ought we to be, and how fearless of death! If we are interested in the mediation of Jesus Christ, we may rest assured that we shall not be taken out of the world till we are ripe for eternal glory.

Seduced by self-love, men are ready to think at the approach of death, that God treats them with

severity, in calling them so soon from the world: but let us rest assured, that however premature our death may appear to us, it comes at the properest time, both for ourselves and mankind. But let us never presume upon a certain number of years. It is true, that more people die at three years old than at fifteen; but if in a small town there die annually but five young persons, how can any one of that description be certain he shall not be of the number? Or if he passes fifteen, how does he know that he shall not be taken off the next year? Let us be animated to finish our appointed work, in the years we are likely to live, since we know not what a day may bring forth. Never let us flatter ourselves with a long life. In the years of our greatest strength, death makes the greatest ravages; and often when we think we have formed the wisest plans for a long and happy life, death comes suddenly upon us in the midst of our hopes and projects. How wise will it be, therefore, to make an early preparation for that death which may surprize us in a moment! God has decreed in his wisdom, that about thirty thousand people should die every day: how likely are we to be of that number! How important then is it to think upon death daily, and to be well prepared for it. Let us be prepared to meet death, that, come when it will, it may find us watchful, and we may, even in our last moments, triumph over it.

FEB. 11.

Reflections on Ice.

WATER, when condensed by cold, insensibly loses its fluidity, and is gradually changed, as the cold increases, into a solid body called ice. This change, which in winter happens every day, deserves to be attentively examined: it is proper at least to observe some of the phenomena discovered in frozen water. Ice is considerably a lighter body than water, for in a thaw it is always observed to swim at the top of the water; but if it were heavier, it must necessarily sink to the bottom. The increase of its size is what makes it lighter: for though at first it is rendered more compact by cold, it dilates when it becomes ice. This dilation is formed with such violence, that the ice can burst a copper globe of such a thickness as would require a force for that purpose of twenty-eight thousand pounds. Ice is quite transparent when first formed at the top of the water; but as it thickens, it becomes opaque. This darkness proceeds more or less from the air-bubbles which meet in the ice, and thus occasion a more frequent refraction of rays: even in the severest cold ice exhales many vapours. Repeated experiments shew, that in the sharpest frost, four pounds of ice loses by evaporation a whole pound of its weight in eighteen days; and that a piece of ice, weighing four ounces, loses in weight four grains in the space of twenty-four hours. The manner in which ice is formed is not less remarkable. It is after this manner: in a gentle frost, a multitude of small strings dart from the sides within the glass, and take differ-

ent directions, in all sorts of angles, till, by continually uniting, they form at the top of the water a very thin coat of ice. Other threads succeed these, which multiply and enlarge into the form of flakes, which still increasing in number and size, unite with the first coat. As the ice thickens, a multitude of bubbles appear, which become larger in proportion as the cold increases: hence it is that the transparency of the ice diminishes, especially in the middle. Then it begins to dilate with violence, and to swell into a larger size. When it freezes very sharp, a thin membrane is formed on the surface of the water, which quitting the sides of the glass, extends towards the middle. Other membranes arise under this, which appear in triangular shapes, the basis of which is at the sides of the glass, while the sharpest angles dart toward the middle. Thus it is, that as the crust of ice thickens, it darkens by the bubbles of air it contains, and by dilating becomes lighter.

But after reflecting thus on these phenomena, is it not natural and right to say to ourselves, What beauteous order, what harmony reigns even in the least works of nature! How does every thing in nature unite to fulfil the designs of God! How great will be our admiration, when we have a more perfect and distinct knowledge of all his wise and gracious purposes!

FEB. 12.

On the spherical form of the Earth.

PEOPLE often imagine the earth to be an even plain, a circular flat surface; but were that the case,

the exterior limits of this surface would certainly be found out, and it would be impossible in approaching any place to see the tops of mountains and towers before the lower parts of them. The earth then must be globular, though it is not exactly so; for it is somewhat raised under the line, and flatted towards the poles, almost in the form of an orange. But this is a very small deviation from the circular form; at the most only ten German miles, which is almost imperceptible in a globe whose circumference is five thousand four hundred German miles, and the diameter one thousand seven hundred and twenty. We shall not doubt of the spherical form of the earth, if we observe, that in eclipses of the moon, the shadow cast on that planet by the earth is always round. If the earth were not globular, how could it have been sailed round? How should the stars rise and set sooner in the eastern countries than the western? Here again God has manifested his wisdom: he has given to the earth that form which was most proper and convenient for the inhabitants of it. By this mean light and heat, so essential for all creatures, are equally and uniformly distributed over the whole earth: hence, also we have the constant and regular succession of day and night, heat and cold, wet and dry. The water also is equally distributed over the whole globe, and the salutary use of the winds is every where felt; had the earth any other form, we should be deprived of all these advantages. In some countries it would be a chaos, in others a paradise; one part of the earth would be drowned in water, and another burnt with the heat of the sun. In some countries,

terrible tempests would destroy every thing ; while in others, they would be stifled by the want of air, the current of which would be almost stopped. The benign influence of the sun would be enjoyed in one part of the earth, while another would be frozen with cold. We should betray great pride and ignorance, did we not acknowledge in this the hand of an almighty and beneficent Creator. If, like the brutes, we are insensible of this admirable plan, and of the benefits which may arise from it, surely we deserve not to inhabit a world, where all is so wisely ordained. No, my blessed Creator ! let me never be guilty of such monstrous ingratitude. Let me adore thy wisdom, my weakness permits no more. Thou wilt kindly accept my humble attempts to glorify Thee, however imperfect they are in themselves.

FEB. 13.

On the short duration of Snow.

How quickly, in the rays of the sun, in mild damp airs, or in heavy rains, does the snow disappear ! All things around us soon wear a new appearance, and every trace of that snow is soon removed, which had covered the earth.

This sudden revolution is well calculated to lead us to reflect on the uncertainty and vanity of all earthly things. Nature tells us this great truth, with a strong and persuasive voice, in every season, and in every variation which their return occasions, all is vanity. Which ever way we look, all is frail and

perishable. The pleasure of the senses, how soon are we deprived of them! we scarcely begin to enjoy them before they disappear! At sun-rise we are often cheerful and content; before it sets we are plunged in distress and sorrow. Riches, of which men are so proud, often make themselves wings and fly away from the possessor, when he flattered himself most with an uninterrupted and peaceable enjoyment of them. The step from the greatest opulence to misery and want, is often as sudden as a thaw after the severest cold: this, however, we might support, if our health and life were not full as transitory as all other sublunary things.

Yet we seldom think of these things while we are in possession of earthly enjoyments. We are like persons, who, in a fine winter's morn, venture abroad without thinking of the sudden changes of the weather in that season. When the sun of prosperity shines upon us, and we are in the midst of joy and pleasure, we imagine we have nothing to fear; and do not consider how soon the happiest situation may be changed into misery. However prosperous we may hitherto have been, we shall soon be convinced of the frailty and nothingness of all things here. It will soon be winter with those who are now in the spring and summer of life; then will they experience how transient those enjoyments are, on which so many depend with so much confidence. Time will teach them, that all earthly pleasures are like snow, which indeed dazzles the eye, but is soon dissolved and seen no more.

Snow may remind us of our weakness and want of power: all human force and industry would be in-

sufficient to remove the ice and snow from the ground. This the Almighty does with infinite ease: he commands, and they instantly obey. Whilst he does such great things in nature, let us remember that he has the same power in the world of spirits, and in ordering our destiny: when he speaks the word, our troubles cease.

FEB. 14.

A brief History of the Creation.

THERE was a time when our earth and the planetary worlds did not exist. God willed their existence; and his almighty power produced the heavens and the earth. Still all was a confused and shapeless mass, generally called a chaos: God gave motion to this mass on the first day of the creation, and separated the luminous and fiery parts from the more dark and gross. The light God called day, and the darkness night; but the fluid and solid bodies were still mixed together: the Creator separated them. The waters he collected from the atmosphere, and caused vapours to ascend from the earth; which, as they thickened, became clouds, and formed that lower firmament which we call sky: this was done on the second day. Still the waters covered the face of the earth: on the third day they were separated. The waters collected in different reservoirs, and the dry land appeared in all its beauty. Perhaps each plant and tree already bore its fruit, and every vegetable contained the seed necessary for the propagation of its species. On

the fourth day God made the sun and the moon, to distinguish day from night, and to regulate the seasons of the year: he made the stars also. Part of the living creatures received existence on the fifth day. The waters were filled with fish of different sorts and sizes, to which bodies were given suited to the element they were to live in. The air was peopled with all sorts of birds, to whom instinct was given to perpetuate their kind. Nothing now remained but to cover the earth also with living creatures: this the Creator did on the sixth day. He produced from the earth a great variety of wild and domestic animals, to answer the purposes for which they were intended. Finally, God created an almost imperceptible number of reptiles and insects: all these, when they were formed, were arrived at perfection. Man, who was to be lord of all these creatures, must now be introduced into the world.

Then God created the first man, and as he stood related to the corporeal and intellectual world, he gave him a body formed of earth, and a reasonable soul. The woman was taken out of Adam's side, and presented to him as his companion. These two beings, as they were the last creatures that God formed, so they were also the most admirable master-pieces of his wisdom and power.

Can we possibly reflect on this history, without being filled with admiration and astonishment at the infinite wisdom and power manifested in the works of creation? Which ever way we cast our eyes over this vast stage, we every where behold the Lord God Almighty, whose power is not only immense, but incomparable. "The heavens declare the glory of

"God, and the firmament sheweth his handy "work." All creatures are so many proofs of his adorable perfections: without such considerations as these, we are unworthy to inhabit this immense universe. While we acknowledge the divine glory in the works of creation, should we not be filled with the most lively sentiments of veneration, love, gratitude, and confidence? God is an object worthy of the most profound respect, and warmest affection: he is the great source of all that is delightful and beautiful in nature: he alone is worthy of praise and adoration. For such employ we were created, and all creatures invite us to it. May divine grace lead us on to so pleasant and delightful a work!

FEB. 15.

On the bodily advantages which the beasts have over us.

WHEN we consider the bodies of beasts with attention, we find they possess advantages which we do not. In the first place, their bodies are certainly more solid, strong, and lasting. Most animals, as soon as they are born, can make use of their limbs and seek their food; nor are they subject to all the cruel disorders which afflict mankind. How wonderful is the instinct with which they are endued! how subtle and piercing their sight! how delicate their smell! how swift in all their motions, whether they fly or run! The marvellous constructions of their organs, their admirable make, and majestic form, put them in regard to body, almost upon a

level with mankind, and in some things they have the advantage over us. Some dissatisfied mortals complain because they have not the swiftness of the birds, the strength of the horse, the smell of the dog, and the piercing sight of the eagle. But such murmurs are only proofs of our stupidity and ignorance: did we know the worth of a reasonable and immortal soul, we should be sensible of the vast advantage we have over the animals, notwithstanding their particular instinct and address. But their noble endowments, and surprising instinct, serve in a manner to compensate for the want of reason, and other advantages peculiar to mankind. We, by our understanding, can preserve ourselves from many disorders and dangers: and we can likewise, by observing rules, and having recourse to medicine, relieve, and even cure many diseases. By our intellectual faculties we can procure and enjoy a thousand conveniences: our intercourse with others contributes much to our welfare. Of all these advantages the brutes are deprived, for want of reasoning powers which God has given to us. Let this lead us to admire the paternal care of a gracious God towards man. For us it is that he has formed the brute with such wonderful art: their extraordinary strength, agility, industry, and exquisite senses, render them the more serviceable to us. The more bodily perfections they possess, the better they answer our purpose, and the greater advantage we derive from them. But all their advantages are limited to the present world: whereas we are formed for a better. Happy is that man who is moulded into the image of his Maker! His body shall be

raised from the grave to the highest degree of glory and perfection; where he will be free from all the defects and wants which he is subject to in the present world.

Feb. 16.

On the Moon.

Next to the sun, the moon is, of all the heavenly bodies, that which has the most salutary influence upon our globe; and if in itself it were not an object worthy of our attention, it would become so by the great advantages we derive from it. Without a telescope, even with the naked eye, we may discover several phenomena of the moon. It is an opaque globular body, which borrows its light from the sun, and (as the earth turns upon its own axis) it is apparent to, every part of the world in twenty-four hours, and completes its own revolution in about thirty days. But what the naked eye can observe in the moon, is nothing in comparison of what has been discovered by the assistance of glasses. How great are our obligations to those enlightened men who, to increase our knowledge and to give us more exalted views of the glory of our Creator, have made discoveries, which enable us to form the highest notions of the heavenly bodies! In consequence of their laborious observations we know that the moon, which appears so small to the naked eye, is two thousand one hundred and eighty miles in diameter. Her proportionable size in regard to the earth, is as one to forty eight; and though

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"But what the naked eye can observe in the Moon is nothing in comparison of what has been discovered by the Assistance of Glasses &c. 16.16th

she is nearer to us than any other planet, her distance from the earth is reckoned two hundred and forty thousand miles. In the moon there are several spots, visible to the naked eye: some of them are pale and dark, others are more or less luminous, in proportion to the light they reflect. Probably the bright spots are high mountains, which reflect the sun's light from their top; and the dark spots, perhaps, are seas, or deep valleys and cavities: hence we may justly infer, that the moon is a more considerable body than some people are ready to imagine. The distance, the size, and all that we know of it, give us a new proof of the unlimited power and wisdom of God. But is so vast a body as the moon intended for no other purpose than to light our earth at some particular times, and to cause the flux and reflux of our seas? Is it likely that a surface of some millions of square leagues should be without any living creatures? Would that God, who delights in variety, have left such an immense space an empty desert? Surely not. May we not rather suppose that God has established an empire in that planet as well as in our world. But as these are only probable conjectures, let us confine ourselves to the advantages which arise to us from the moon. In this case, as in all others, the tender mercy of God towards man is very strikingly manifested. In consequence of her nearness, the moon affords us more light than all the fixed stars together: by it we can undertake journeys, can prolong our work, and transact much business in the night: besides, the regular changes in the moon keep us from confusion in regard to the division of time. Certsinly the calculations of astronomers save us

the trouble of attending to all the variations of that planet; but all the advantages derived from almanacks is owing to observations made on the course of the moon.

Feb. 17.

The earth is watered and fructified by Rain.

Rain, and other vapours which descend upon the earth, are the principal causes of its fertility. Were the watering of the earth left to the care of man it would be an endless trouble, and after all, we should be destroyed by drought and famine. Mankind would use all their powers in vain, and could not water what they had planted. The pumps and rivers might be drained, and yet the vegetables and plants would wither and die. How necessary, and how great a blessing then is rain! The earth is enriched by every shower, which would otherwise wear a sad languishing appearance. The treasures of its surface are infinitely more valuable than all the gold, silver, and precious stones it contains in its bowels: we could live without silver and gold, but not without corn, vegetables, and pasture.

Let us for a moment think on the inestimable blessings that rain produces. The face of the earth is renewed by a seasonable shower, much more than by the dew: the furrowed fields drink eagerly in the beneficent rains poured upon them. Seeds begin to vegetate and second the labour of man: he ploughs and sows, and plants, but God gives the increase. Man, in this case, does what lies in his power, and whatever is beyond it the Lord himself provides for.

He covers the seeds in winter as with a garment; in summer he warms them by the sun, and refreshes them by the rain. The year is crowned with his goodness, and fills the hearts of men with joy and gladness. The blessing of rain is universal, and countries deserted by man are favoured with it. Such is the divine goodness, that the valleys and the hills rejoice, and are adorned with smiling verdure. The rain does not fall upon them in vain: they produce what is some way or other beneficial to mankind.

May we never forget the blessings of God! How often, and especially in this month, is the earth watered with rain; but how apt are we to forget the divine goodness in this respect. What would be our situation if the sky were to become like brass to us, and the earth as iron? All trees and plants would perish; all living creatures would faint; the rivers would quickly be dried up, and we should inhale death with the air. But God sheds new blessings upon us, every time the rain waters the earth: yet we are ready to complain and murmur when the rains are too heavy, or last too long for us. We are ready to censure the divine government; but let us rather bless and adore the Creator for all his goodness towards us. The seasons are renewed by his order, and regularly succeed one another. For us the rain falls and fructifies the earth; God opens his liberal hand to supply the wants of men. His blessings rest on our land, and fill it with peace and plenty. We ought then to adore our Creator, and sing to his name hymns of glory and praise. These displays of

his goodness, in time, may well raise our expectations as to futurity.

FEB. 18.

On the images of Death which Winter affords.

WE require perpetual warnings to make us think of our latter end. We naturally are inclined to banish the thoughts of death from our minds; and the avocations and pleasures of life scarcely allow us proper time to think of it in a profitable way. Nevertheless, in order to lessen the fears of it, and be prepared for it, it is necessary to reflect often upon it. It is proper therefore to take advantage of the present season, and to consider some of the objects before us as the images of death. Nature has lost the beauty and charms with which it was adorned in summer; now we desert the fields and the gardens where we then walked with so much pleasure. There is no longer any thing inviting in them; and so short and disagreeable are the days, that we cannot wish to pass them in the country: this is a lively image of our state when arrived at the winter of life. Then all the charms we are so vain of in the spring and summer of life disappear. In consequence of the infirmities, vexations, and peevishness of old age we can no longer enjoy or relish the amusements of youth; and our company is not desired by young people. Thus, under the burden of old age, if we are reasonable, our wishes tend towards a better life. At this season, how short are the days! and

yet however short and dull, we ought not to complain of it: as the life of Christians is a constant struggle against sin and misery, it is a great blessing that God has so limitted this earthly existence. As the path to heaven is narrow and full of thorns, we ought to bless God for making it so short.

Some animals pass the winter in a torpid state, from which they do not awake till they feel the mild and enlivening warmth of spring: so will our bodies rest in the grave, till they shall be awakened at the day of judgment from the sleep of death. In winter we are often surprized and overtaken by the night before we are aware, and in the midst of our employments. Here is another simple image of the night of death; perhaps it will come when we least expect it. In the midst of projects for future life, in the midst of great undertakings which we hoped to accomplish, death may overtake us in a moment. O God, grant that it may find me so employed as to be conducive to my eternal happiness!

The length of the nights in winter is the most melancholy circumstance that attends them: and perhaps one reason why many dread death, is the thought of being so long in the grave. But as the nights in winter glide imperceptibly away in a profound sleep, so will death insensibly pass by; and, ere we are aware, the great light of the new creation will shine forth. Winter presents us with these useful and edifying reflections. Let the thoughts of death be more and more familiar to us daily: faith in the Redeemer will enable us to meet it without fear, and give us victory over it and the grave.

Feb. 19.

Means to procure fire.

Fire, in these long winter nights, and during the severe cold weather, is an inestimable blessing, for which we cannot be too thankful. Our lives would be wretched and miserable at this season, if God had not given to fire the virtue of lighting and warming our houses. This element is to be found every where, and in every thing : it is found in sulphur, in the fat of animals, in bees-wax, and in all vegetables, though they appear inactive. By the quick repeated friction of hard bodies, such as flint and steel, the fire which they contain is put in motion: the particles or sparks produced in this way have sufficient force to fire other bodies. By this method we generally obtain fire for domestic uses ; but we often enjoy the advantages derived from fire, without enquiring how it is produced. Were we more attentive to the causes of certain natural phenomena, we should every where meet with traces of infinite wisdom and goodness. Certainly, in this instance, it does not require much reflection to discover them. God has spread fire all around us, and throughout all nature, with a beneficent view. Fire takes every kind of form for our use, and by uniting with other bodies, it becomes of great advantage to us. How happy would it be for us, if we did but accustom ourselves to be more observant of the many and great blessings we daily receive from the bountiful hand of God ! Alas, how sad, that the constant and daily enjoyment of them should

make us so cold and indifferent to them! O! let us often think of our wise and gracious Preserver; and while we enjoy the most inconsiderable blessings, let us accustom ourselves to raise our hearts to him, and to praise and adore him as the source of all good!

FEB. 20.

On the equal distribution of the Seasons.

THERE are some countries where the inhabitants enjoy all the beauties of spring, while the sun is far from us, and cold binds and shuts up our earth; there are others where they are gathering rich harvests, and others where autumn fills their storehouses with fruit. In this manner divine wisdom has regulated the change of seasons, and distributed the same blessings to all creatures at different times. Thus God is good to all, and his tender mercies are over all his works. He is kind even to the unthankful; more so to them who seek his face. God visits with his blessings the deserts of Arabia, as well as the smiling countries of Europe: his government is the same from pole to pole. But if there be an equal distribution of the enjoyments of this life, why are some countries deprived of the pleasures of spring, while others enjoy them? Why are the rays of the sun so partially spread, that in some countries there is darkness, and others light, for months together? Why are not the frozen countries near the pole as fertile and beautiful as our plains and valleys? Who, or what then art thou,

O man, that darest to ask such questions? What right hast thou to blame the divine government, or to demand of an infinitely wise God, an account of the manner in which he rules the world? Learn to be humble, vain mortal, and acknowledge marks of sovereign wisdom, even in those things wherein thy weak understanding supposed there were defects. God has given to each country what is essential to the life, support, and content of his creatures: their nature is suited to the climate they inhabit, and God has every where provided for their preservation and support. Though the hours of the day vary in different parts of the world, according to certain rules, yet all the zones have nearly an equal number. In the torrid zone, the days and nights are always equal. In the temperate zone, that is the case but twice a-year. Certainly the sun quits them by turns, and affords summer to one side of the earth, while the other is abandoned to winter: but it constantly returns from one limit of its annual course to the other; and though the days in winter are shorter than the nights, summer abundantly supplies that defect. The inhabitants even of the frigid zone, who do not see the sun for several months together, see it afterwards above the horizon several following months; and though they have a few hours less of day-light, they are made amends for it by longer twilight.

Lord! the earth is full of thy goodness: thy mercy is spread over all the heavens, and reacheth to the very clouds! All nations in the world experience the effect of thy goodness: all creatures feast on thy bounty. Happy for me that I live under

thy merciful government! Adored be thy name, for the numberless blessings which thou scatterest over all the earth, for the benefit of thy creatures! It is my desire, that all my fellow creatures throughout the world might be as tranquil, as content, and happy, as I am. I would not behold with regret the happiness of others, nor wish their welfare less than my own. Grant, O God of love, that I may become more and more like unto thee! As thou art good to all thy creatures, grant me this god-like disposition, that I may do good unto men as far as I am able. To thee may I lift my ardent prayers for all mankind, without exception.

Feb. 21.

On the utility of our Senses.

I am endowed with senses, that is to say, I am a being, who by means of several wonderful organs of my body, can procure myself different sorts of sensations. By my eyes, I can discern light and colours; by my ears, I can distinguish sounds; by my smell and taste, I can tell what is agreeable or disagreeable to my palate; and in fine, by my feeling, I have the sense of heat and cold, soft and hard, wet and dry, and the like. How wretched should I be if I were deprived at once of these organs! Had I no sight, how could I escape the dangers that surround me! how could I form a proper idea of the magnificence of the heavens, the beauty of the earth, and all the agreeable objects with which it is filled! Without the organ of hearing, how could I perceive

many dangers at a distance? how could I exchange or communicate thoughts? how could I enjoy the charms and the harmony of music? how could I, when young, acquire knowledge, learn languages, obtain ideas, and many other faculties, which so advantageously distinguish me from the brute creation? Had I been refused the organs of taste and smell, how could I distinguish in my food what was hurtful and what was not? how could I enjoy the perfumes of spring and many other things which now afford me such pleasing sensations? And lastly, were I without feeling, how could I discover, either asleep or awake, what was hurtful to me? or how could I attend to my preservation? How then can I be thankful enough for all these faculties! Merciful Creator, I would praise thee in songs of humble praise: my ears shall open to the sound of thy truth, and to the hymn which all nature chaunts to thy honour. Thou hast given me senses for the noblest purposes: may I ever have them in view! may I never employ my senses in brutal enjoyment, which would render me wretched. A time is coming, when my eyes will no longer be affected with external objects; when my ears will no longer be charmed with the harmonious sounds of music; when my palate will not be pleased with the most exquisite dainties and the most delicious wines; when all earthly things will afford me no pleasure. What a miserable being should I then be, if I knew of nothing that could feed my mind, and comfort my soul! Direct and lead me, O God, so as to use my senses, that I may never lose sight of the great end of my creation!

Feb. 22.

Elevation of the Soul to God.

When I lift up my soul to God, I approach the end for which I was created, and enjoy a foretaste of that felicity which awaits me in heaven. When my soul seeks its joy and happiness in God, how contemptible do the vain and trifling amusements of the age appear to me! I sink into self-annihilation, when I compare my nothingness with the infinite majesty of God! My nature is mortified when I lose myself, as it were, in the infinite ocean of divine perfections! What an ardent desire is then kindled in my heart for that glorious and happy day, when I shall be for ever united to the Eternal Being! But do my reflections on the adorable Creator induce me to live to his glory as I ought? Alas! instead of my mind being filled with this great object, it is too often fixed on trifles. May I learn wisdom hereafter, from my past experience! I have been too much given up to temporal things: I have sought for happiness in objects more perishable, if possible, than myself: but now I would contemplate a Being who is the centre of all perfection, who made me out of nothing, and gave me a soul, the desires of which nothing can fill but God himself; nothing but infinite blessing can satisfy. To him would I consecrate myself, and would live devoted to his glory: he shall for ever be the centre of my joy and comfort. I will exchange all earthly delights for the real and solid advantages of religion. May I never more make a god of temporal blessings! Rather

may the enjoyment of them lead me to bless and adore the bountiful Donor. While earthly blessings animate and cheer the mind, may I be led to reflect on the superior delights of a future state. When my soul, freed from all its fetters, shall contemplate the wonders of redeeming love, what ineffable delights shall I then enjoy! If I am so enlivened by a single ray of light, what will the sun itself be? If God be so glorious in his works below, what must he be in the heaven of heavens!

Feb. 23.

The causes of Heat and Cold.

What are the causes of the transitions from excessive heat to the severest cold? How does nature affect these changes? Without doubt the temperature in winter depends on the situation of the sun: for when our world, in its annual course round the sun, is so placed, that its northern hemisphere turns from it; when its rays fall very obliquely upon us, and when the sun itself is but a few hours above our horizon, it is impossible it should give much warmth. But the heat does not altogether depend on the situation of the sun, which annually passes through the same signs, and is not further from us one year than another; yet the degrees of cold in winter are very different. In some winters deep seas are frozen, and men and animals can scarcely exist; at least can hardly protect themselves from the cold, while others are as mild as autumn. Even in those countries where the days and nights are of equal

length most part of the year, the sun's power is too weak to melt the ice on the tops of high mountains. At their summits, the severest winter reigns, while in their valleys there is excessive heat, though the sun's rays fall equally on both places. These phænomena would be unaccountable, if the sun was the only cause of heat and cold. Nature is rich in means, and perhaps a thousand causes unknown to us assist its operations. We are certain that the nature of the air and the winds have great influence in regard to heat and cold. Hence it is often cold in the long days of summer, when the atmosphere has been some time darkened with clouds ; or when a sharp wind blows from the north. Hence it comes to pass, that in winter the weather is mild when the southerly winds bring us warm air. Even the nature of the soil may contribute to heat or cold. In Siberia, for instance, where the ground is full of nitre and other salts, it is always colder than in countries nearer the pole, and where the sun's rays are more oblique. The interior heat of the earth may also cause a difference in the temperature of the air in certain countries.

These, and many other causes unknown to us, occasion the changes of heat and cold upon the earth. Who can know all the springs of the great machine of the universe, or explain their various effects ? We are often confounded when examining the phænomena of nature : even the greatest philosophers cannot fathom all her amazing depths. We see but the smallest part of her operations. Many things in nature and in providence are wisely hidden from us. that we might turn our thoughts to our-

selves. Perhaps a greater knowledge of nature would feed our vanity, and cause us to forget the God of nature. Let us wisely improve what we possess, by living to the glory of the Supreme Being. If there be many things concealed from us, after all our inquiries, let it teach us to infer, that the infinite wisdom of God surpasses all our conceptions; that we are but of yesterday, and know nothing: and therefore it becomes us to humble ourselves and adore the Most High.

FEB. 24.

On the singularities in the kingdom of Minerals.

IT would perhaps be impossible for our weak and limited understandings, at once to take in the whole kingdom of nature, and to learn altogether the wonderful properties of things. It may be best to begin with some particular beauties, and dwell on the most striking phænomena. Let us then turn our present thoughts on some of the curiosities among minerals. We shall there discover, as in all things else, traces of the infinite wisdom of God. How worthy of our attention is the loadstone! when it is suspended, it constantly turns by attraction one end towards the south, and the other towards the north pole. It is to be remarked, that it attracts nothing but iron; and that if two loadstones be put together, the southern and northern poles attract one another, while, on the other hand, the two southern or two northern repel, and seem to fly from each other.

There are two properties equally wonderful found

in quicksilver : it takes every form you can wish, but always resumes its own natural form again. It rises into vapour in the fire ; when shaken a long while, it changes into dust ; when dissolved, it becomes a hard and transparent crystal ; but may again be restored to its former fluid state.

Gold is the principal and most valuable of all metals, partly from its scarcity, and partly from its admirable properties. It is perhaps the most unalterable of all bodies ; it can bear the hottest fire for two months, without any sensible loss in its weight. So fine are its parts, that a grain of beaten gold will cover fifty square inches, in such a way, that on the two surfaces the naked eye may distinguish four millions of particles. Such is its ductility, that a single grain may be drawn out into a thread of five hundred feet long.

Our curiosity is also justly awakened by the wonderful form of common salt, by the singular figures of the earth where the metals are contained : by the petrified bodies that are often found on high mountains, some hundreds of miles from the sea, which is their original source ; and by an hundred other singularities in the mineral world. How instructive, how charming, is an attentive observation of nature ! Were we destined to live ages on the earth, and to employ them all in examining the singularities of minerals, our curiosity would be still more and more raised by a thousand inexplicable wonders. But since our life is so frail and so short, let us principally attend to the grand duties of it, in glorifying God and preparing for eternity. Nevertheless, as we have an opportunity, let us look into the works

of nature, and reflect on the admirable ends which God has proposed to himself in them. The wonders of nature are infinitely more admirable and sublime than all the productions of human art. The latter do not always promote our welfare; but all the former tend to the universal good of the whole world: and while they are to be enjoyed, they all proclaim the wisdom and goodness of the Creator.

Feb. 25.

On the constant proofs of Divine Providence.

How innumerable are the blessings which have been heaped upon us by our merciful Benefactor, from the first moment of our existence to the present hour! We cannot even reckon the blessings of one year; much less of a long life. How many forgotten mercies did we receive during our infancy? How many dangers, seen and unseen, have we been delivered from! How often has God confounded our unbelief, and provided for our necessities when we thought it impossible! The mercies of God have increased with our moments: day and night the Lord has been our support. It is impossible to tell how often God has shewn his mercy, and preserved from dangers, which we shall know nothing of till we come to the other world. What shall we then think of the mercies of the Lord, in having redeemed us through the blood of his own eternal and only begotten Son; in having given us the gospel to point out the true and only way of salvation, through the perfect righteousness of our Redeemer! What

a mercy that we are not inveloped in pagan darkness; and that God not only wills, but works our sanctification, and makes us meet for glory! How impossible then to reckon the amazing sum of his blessings! Daily are we favoured with light, air, food, strength to labour, the habitation we dwell in, and the relations on whom our happiness depends. O that these daily proofs of the good providence of God, may make the strongest and most lasting impressions upon our hearts! undoubtedly they will, if our hearts be softened by divine grace. If we are conscious of God's greatness and mercy, and of our own unworthiness, it is impossible we should not feel the warmest gratitude to our heavenly Father. Let us think more of the number and magnitude of his blessings, in order to excite us to thankfulness. May our praise begin here, and flow on for ever and ever.

Feb. 26.

The tranquillity of the Night.

How tender is the care of providence in securing to us repose in the night! At the close of a day, a calm is spread over all nature, which proclaims rest from labour, and invites mankind to sleep. In favour of man, nature is hushed, and every lively impression is withdrawn. All animals, whose activity might disturb our rest, need it themselves; and while they sleep around us, all appears tranquil. But this tranquillity is not equally agreeable to all: many who cannot rest, in consequence of pain and

sickness, would be glad to have this melancholy silence interrupted: their sufferings seem augmented while all are asleep around them. They are impatient of the day, in hope that they may find some relief from society. Many wicked people, through intemperance, render their nights painful and troublesome: perhaps their consciences are awake, and the least noise fills them with terror. O God, I bless thee, for making the repose of the night so refreshing and agreeable. The health of body and peace of mind I enjoy, procure me the sweetest sleep. I adore thy goodness at the approach of night, which is so happily disposed to give us a quiet repose. I lie down in peace while wicked men and robbers traverse the dark paths of crimes and sin: I sleep in peace, while many are filled with exquisite pain. How would they prize the shortest repose while the miser is tormented with sordid care, and with the fear of wanting the necessaries of life; and while the ambitious man rolls in his mind his undigested schemes of future elevation and greatness, I enjoy refreshing slumber.

But how often is the tranquillity of the night interrupted by levity or malice! The turbulent noise of drunkards, and the wild spirits of libertines, often disturb our repose. What evils sometimes arise from this ill-timed noise to sick and dying persons!

But how different the repose which I hope for in the grave! There I shall sleep in peace, and shall not awake till the heavens be no more. How happy are the faithful whom death has sent to God!—their miseries are all at an end. Our present life, at best

is a mixture of hopes and fears, joys and sorrows. On the contrary, the righteous whose bodies rest in the grave, are free from all care, sorrow, pain, and misery.

Feb. 27.

Winter an emblem of life.

The weather constantly varies in these winter days. Showers of rain, flakes of snow, calms and storms, serene skies, and cloudy days, succeed each other. Ere the snow has covered the ground with its brilliant whiteness, the rain comes to destroy it. The sun peeps from behind a cloud, and disappears again. Do not the same changes take place in the moral world? Many scenes through life are dark, dull, and gloomy, like the days in winter. But as storms and darkness are needful, and conformable to the wise laws of nature, so are the afflictions and distresses of human life. It is not possible the sky should be always calm and serene, nor can we enjoy in our minds uninterrupted repose. Storms in the natural world are like passions in the moral. What mischief is sometimes done by them! Winter and frost render the earth fertile, and afflictions and pains are often the means of humbling us, and making us wise. Darkness teaches us the worth of light: perpetual light would fatigue and dazzle the eyes. A serene day appears most beautiful after dark and cloudy weather: in like manner we should be less sensible of the blessing of health, if we were not taught to feel it by the painful effects of sick-

ness. The advantages of friendship would be less felt, if our friends did not sometimes prove faithless. But after all, we generally exaggerate our evils. We are often so blinded by self love, by pride, and excessive delicacy, that we view every thing that happens to us as real and great evils; while on the contrary, we overlook our advantages and the sweets that attend us. Certainly all our troubles ought to be viewed as nothing, when compared with the blessings and pleasures bestowed upon us by divine providence. Afflictions, if sanctified, are blessings in disguise; just as the frost and snow are favourable to vegetation, and means of procuring us new favours. How beautiful is the clear shining of the sun after rain! The heavier the showers, the sooner the clouds vanish. When our trials appear the heaviest, and we are ready to sink under them, it is a proof they will soon be over.

I will then, without murmuring, accept the bitter with the sweet. It would be unreasonable to expect nothing in this world but pleasure and joy. Lord, let rain and sunshine, darkness and light, succeed each other! I submit. If thou seest it needful to shake my soul with the storms of adversity and trouble; thy will be done! Of what consequence is it whether my cup be more or less bitter, or whether my troubles be short or long on this side the grave? I know in whom I have believed. O my God! thou wilt, I know, one day grant me eternal salvation. Those who sow in tears shall reap in joy. I shall find the benefit of my troubles when they are over, and shall bless God for having conducted me to heaven through the paths of tribulation and sorrow.

These thoughts will yield me support in my darkest hours. As the gloomy appearance of winter is rendered supportable by the expectation of spring, so am I encouraged to bear, by the hope of a happy futurity, the present calamities of life. A delightful prospect of a happy eternity, opens to me at the end of the dark passage of life. The glimpses of glory shed sweet light on the path through which I now walk. May I be guided and supported till I imperceptibly arrive at the happy abodes of light, peace, and eternal joy!

Feb. 28.

On the use of Mountains.

Would it be more advantageous to our globe, if its surface were a perfect level, and not not disfigured by so many mountains? It sometimes seems to me, that the form of the earth would be much more regular, that our view would extend further, that travelling would be more convenient, and that we should enjoy other advantages if the earth was an entire plain: but I am perhaps much mistaken in this opinion. Therefore I would inquire into it, and reflect on the use of mountains, in order to see whether I have any reason to be discontented with the present plan of our globe.

It is evident, in the first place, that the springs flow from the mountains and hills, and hence the course of rivers is kept up. Those vast chains of high mountains, which extend from east to west for a great distance, serve to hinder the dispersion

of vapours, and to condense them into water. They are like so many stills which prepare and render the waters sweet and fit for use. The springs flow gently down their declivity into the valleys, which they water and render fruitful. Mountains are also dwelling places for many animals useful to mankind. Multitudes of beasts subsist upon them, whose flesh and skins are very necessary for us. The sides of the mountains produce trees, plants, and an innumerable quantity of useful roots and herbs, which cannot be cultivated with equal success in the plains, nor be brought to perfection. Metals and minerals are formed in the bowels of mountains, nor would they propagate so well in any other place. Mountains are a screen from the blasts of the cutting and cold north and east winds. They produce the most exquisite vines, and their bosoms contain precious stones. They may be called the bulwarks of nature, to guard countries from the fury of seas and tempests. They are also like ramparts and natural fortifications, a defence to some states from the invasion of enemies and the ambition of conquerors: perhaps they preserve the balance of the globe. Certainly some of those mountains are dangerous and formidable. They produce many shocks and earthquakes: and those which contain volcanoes, often spread flames and destruction all around. But it must be remembered, that mountains are a sort of general magazine for saltpetre, sulphur, and other minerals, which contribute to the fertility of the earth, and are essential to the life and moistening of all sorts of plants; being scattered by the winds over the whole earth.

Thus while the blessings derived from them are so superior to the evils they occasion, no reasonable objection can be made against the wisdom and goodness of God. We have no reason to complain of the contrivance of our globe. Were there no mountains, we should be deprived of several sorts of stones and fossils: nor would there be any rivers, springs, or lakes. The seas would become a stagnated marsh: and even the privation of one single thing in nature might be enough to make our lives sad and miserable. We ought therefore to conclude, that mountains, as well as all things else, prove the power, wisdom, and goodness of God.

I adore thee, Lord God Almighty! and acknowledge with profound veneration the wonders of creating wisdom. Whatever thou hast created, from the smallest grain of sand to the largest mountain, manifests thy glory, and is useful to thy creatures. Thou shewest thyself throughout all nature, the magnificent Benefactor of all living creatures.

Feb. 29.

Motives for confidence in God.

When I consider the infinite perfections which are manifested in the plan of the universe, and the manner in which God conducts and governs it, my confidence in him is increased more and more. How contented should I rest in regard to my life, since it is in the hands of that great Being who has given me as many proofs as there are creatures in my sight of his power, wisdom, and goodness! That God who

has raised so many millions of worlds out of nothing, can easily fulfil all my reasonable wishes. Troubles and afflictions can never reduce me so low, but what his almighty arm is underneath me. What then shall hinder me from putting unlimited confidence in my heavenly Father? What shall prevent me from having recourse to him in every trouble, or from hoping that he will hear my prayer? Certainly I am but a weak creature; I am even lost in the vast multitude of his works; and when I consider his greatness, and his unlimited empire, I say to myself "Who, or what am I, to dare to hope "that this great God will always listen to me, and "that he will deign to regard my supplications?" Yet, on the other hand, I console myself when I consider, the greatness of his majesty, and his government of so many millions of worlds, does not prevent his extending his care to the meanest worm: why then may he not pay some attention to me, who, though insignificant, and unworthy of his regard, have, as a man, received from him prerogatives much superior to other creatures? But here I am smitten, and reproached by my conscience with being a sinner, and having, times and ways without number, transgressed the commands of my God; which render me more unworthy of his notice than the rest of his creatures who have never sinned against him. The whole world does not paint his power and goodness in stronger colours than my conscience represents his justice to me. I sometimes fear he may use his power in making me a terrible example of his vengeance to the whole world; and which ever way I turn my eyes, I can

find nothing to relieve these dreadful thoughts, to quiet my agitated mind, or to give me the least consolation: but here the glorious truths of his gospel come to my assistance. Eternal thanks to thee for it, O merciful Redeemer! Through thy sufferings and death the knowledge of God, which otherwise would be a terror to me, is now rendered a source of joy and consolation to my soul. It is only through thee that I can look up to God as a friend, and can put my trust in him, that he will grant me happiness in this world and that which is to come.

MARCH 1.

An invitation to contemplate God in the various works of nature.

O YE, who with me adore that Being by whom the heavens and the earth were made, come and reflect on his glorious works! view the wonders he hath done! cherish a lively sense of his mercies! A knowledge of God in his works is necessary to secure our happiness here and hereafter. We do well to endeavour to know God as he hath revealed himself in his divine word; but we ought also to be convinced, that he has revealed himself to us throughout all nature, as our Father and Benefactor. This will pave the way for our understanding and embracing the gospel of Jesus Christ; for he himself, in teaching his disciples, often made use of the works of nature, to lead them to reflect on heavenly and spiritual things. It is a noble employment, and

well worthy of man, continually to study the book of nature, and thence to learn the immense greatness of God, and our own unworthiness, to trace out his blessings, and the obligations they impose on us. How shameful for man to be inattentive to the wonders that surround him, and to be as insensible of them as the brutes are! What is our reason for, but to acknowlege the perfections of God in his works? How pleasing to the human mind are suitable meditations on the admirable works of the Most High! How charming to contemplate in the heavens and the earth, yea, through all nature, the power, wisdom, and goodness of the great Creator! What can be more delightful than to discover, in all objects that present themselves to us, traces of the providence and tender care of the Father of all beings! The mind soon tires of worldly pleasures and amusements; but there is a perpetual and ever-growing pleasure in contemplating the works of the Lord. Were we to reflect upon them for a million of years, instead of being tired, we should find new charms in the sweet employ. I often view the happiness of the saints in heaven in this light, and ardently wish to be with them; because I am persuaded that my insatiable desire of increasing in wisdom, will no where be satisfied but in this society, and in their blessed intercourse with each other. Let us endeavour to come as near to this happiness as possible, while we are at a distance from it, by habituating ourselves now to what will hereafter be our employment for ever. Let us endeavour more and more to be acquainted with the God of nature:

let us think on his greatness, and admire his power and wisdom in all his works. This employment will not only make us happy, but tend to make us good also: for a perpetual view of God in his works will surely penetrate us with love and veneration for so glorious a Being. Surely it would increase our confidence in him and animate us with zeal and transport to sing his praises. O thou that art so worthy of adoration, I would continually reflect on the wonders of thy wisdom and power, which fill the whole universe! By the chain of beings thou hast formed, I would raise myself, as it were from earth to heaven. All that is within me, and all that surrounds me, tend to lead me to thee, as the source of all, and to inflame my mind with love and piety. The sun which shines upon me, the air which I breathe, the earth which bears me and gives me food, all, all shall one day rise as witness against me, if I do not contemplate and admire thy works.

MARCH 2.

On Bad Weather.

NATURE has not yet put on its ornaments: still its appearance is savage and gloomy. While the sky is covered with thick clouds, the air is loaded with vapours of snow. Scarce does the sun shew itself, before dark and stormy clouds arise to prevent the earth feeling its cheerful influence. So little is the warmth that it imparts, that every thing still remains dead and stripped of its charms.

Lovely spring, when wilt thou return? When shall we be invited by the early flowers and fine days to the fields and gardens? No doubt this is the language of many, who bear with impatience the days of March. But even the disagreeable temperature of the air contributes to the good of the whole, and is a part of the wise plan of the Governor of all worlds. Storms are blessings of nature, and frosts tend to render the earth fruitful. Were the weather finer and milder, millions of insects would be hatched, which would be very hurtful to the seeds sown in the earth, and to the opening blossoms: and what would become of the little birds which the mild weather had brought forth, if there should come a severe frost? Nevertheless, such is our blindness and ignorance, that we murmur against God when we ought to bless and adore him. Seldom do we know what we desire. Were God to grant our unreasonable wishes, it would be a sufficient punishment. Did the spring already display all its charms, many succeeding days would be diminished in their value. We should quickly tire of them; and besides a sudden change from severe cold to intense heat would be prejudicial to health. It is a blessing from on high, though we are often too insensible of it, that spring comes on imperceptibly. By its delay our expectations are agreeably raised, and when it comes our pleasure is the greater. However high the believer's expectations are raised, that eternal spring which will soon open upon him will greatly exceed them all.

March 3.

On the state of some Animals during Winter.

As yet we see none of those millions of insects and birds, which during summer are in the air, the water, and the earth. They disappear from our countries at the approach of winter, in order to find a more agreeable climate. The first stormy day is to them a signal to prepare to quit their homes. They are not destroyed by the winter, but continue to live even in that season of the year God has so formed the bodies of some animals, that the same causes which deprive them of food, produce such revolutions in them as prevent their requiring any. They are benumbed with cold, and fall into a sound sleep, which lasts till the spring has produced their necessary food, and till the heat awakens them from their slumber. Many of them hide themselves in the sand, in pits and hollow places, in the bottom of ponds and marshes, where they are neither discovered nor disturbed. There they lie in a torpid state, till the warmth of spring penetrates their retreats. Many birds fly in prodigious numbers from one country to another: many cross the Mediterranean and go to Africa, and in the following spring return to our island.

O Lord, how great is thy wisdom! tender and beneficent are thy mercies, even to the least of thy creatures. Thou hast given to some animals a wonderful instinct, by which they know when to quit their summer habitations, in order to pass their winter in a climate more suited to their nature. These

changes, as often as I reflect upon them, lead me naturally to think of the great change which will take place with me at death; for in some measure my state resembles that of these birds. I shall also quit my earthly home at the end of my life, to go, I hope, into a better world; and though my dust sleeps awhile in the grave, at the resurrection I shall awake; and, in the strength and beauty of youth, shall enter upon a life that will never end. I have also another edifying lesson from what happens to animals: the smallest link of the immense chain of beings is observed by God. Will he not then take care of me? Shall I yield to trouble and anxiety about my subsistence? No doubt, that God who gives to insects and birds their food in due season—that God who finds them retreats, and places to rest in rocks and pits, and who directs them to find their food in different countries; even that God will take care of me in time of need. I am perfectly satisfied that he will provide whatever is necessary for me, even when there is the smallest appearance of it, in life and in death.

March 4.

On Winds and Tempests.

With what violence is the air sometimes agitated! How the winds roar in the upper regions! The clouds, behold how fast they gather! How rapid is their flight! What floods of rain they pour upon the earth! The force of the winds how terrible! The largest oaks are torn up by them; they demolish

MARCH.

"This moment perhaps some unhappy ship is dragged into the Abyss" &c. March 4th

palaces, and shake the foundations of the earth! This moment, perhaps, some unhappy ship is dragged into the abyss, or driven ashore by the violence of the storm! Above it roar the winds; beneath, and all around, is a dreadful gulph, and billows rising mountains high. Alas! distressed is the unhappy crew: they wring their hands; they shudder at every wave that rises to bury them in the deep! some thousands of families may be ruined before the fury of the tempest abates: and many more, who will be plunged in the greatest distress at the loss of their friends and relations. But why does the wise and gracious Governor of the world permit the winds thus to spread terror and destruction by land and sea?—Absurd question! What then are we to judge and censure the government of a Being infinitely wise? Rather ought we not to reflect on his ways with respectful silence, and be persuaded that they are all just and right. Though whirlwinds and tempests make terrible ravages, though they shatter ships, or plunge them whole to the bottom, though they overthrow buildings and destroy men and animals, have we a right to blame the divine government?—Verily no. They who are so careful to calculate the mischief done on the sea, have they thought of the advantages which arise from it? Instead of manifesting their audacity, let them admire and adore the Sovereign of the world, who can cause even storms to contribute to the good of the universe. No doubt, storms and tempests tend to disperse noxious vapours, and to purify the air: were not this the case, plagues and epidemical disorders would soon destroy men and animals. The

winds also serve to mix different vapours together, and render them more healthful to mankind, and more fruitful to the earth. Besides, the wind serves in a good degree as wings for the ships, by which, with their rich burdens, they can often make a passage of fifty miles in a few hours. Thus the Lord acts as a benefactor, even in the midst of storms and tempests. I would acknowledge his goodness every time I hear the winds roar above me, and gratefully recollect the wisdom of his government. O Lord, thou takest the winds out of thy treasures: thou callest them from the extremity of the earth: thou directest the course they are to take; their bounds thou prescribest, and thou makest the storms a calm when they have fulfilled thy designs: why then should I be terrified and alarmed when those ministers of thy will are executing thy divine orders? O my soul! let not thy tranquillity be disturbed, even though the tempest should blow around thee, and the rocks be rent; though a veil of darkness be thrown over all nature, and the earth should tremble to the centre: trust in the Lord, and cast all thy care upon him; he rules and governs the universe; and can he not point out to thee a path in which thou mayest walk securely? However stormy then my life may be, it neither becomes me to murmur nor fear. No. That God who makes the storm a calm, can put a stop to the tempests and sorrows which threaten to overwhelm me; and when my afflictions have answered the end for which they were sent, the day may again become bright, and I may enjoy a perfect calm. Thou wise Disposer of all events, Ruler of the winds and the tempests, deign to hear the

prayers of all that cry unto thee in their distresses!

MARCH 5.

On the Aurora Borealis.

IN winter we often see, towards the vernal equinox, a sort of bright variegated clouds in the sky. There appears from the north a splendid light, which comes close to the other clouds: and from these northern clouds white rays of light dart, which reach even to the zenith. This ethereal phenomenon, known by the name of Aurora Borealis, or northern lights, in some respects, is still one of those natural effects, of which it is difficult to ascertain the cause. It is supposed by some naturalists to be a magnetic substance, which, accumulating and thickening towards the north, sheds a certain light at a distance. Others suppose, which is more probable, that these lights are occasioned by nitrous and frozen particles, which rising in the air and uniting with the vapours and the oily exhalations emitted by the whales, and other similar fishes which abound in the north, are lighted up and become bright, by that light which the Laponese almost constantly enjoy. Other philosophers pretend, that this phenomenon is nothing but the atmosphere inflamed, and a storm not yet come to maturity. There are many things in nature which are still mysterious to the best naturalists. The consideration of which ought to humble the human mind, which is too apt to be lifted up with pride. Many things, in themselves inconsiderable,

escape our inquiries, and confound the most learned in their speculations. This ignorance does not, however, affect our happiness: we can live quietly and well though we should never be able exactly to determine from whence the Aurora Borealis proceeds. But notwithstanding our ignorance in this and other points, we may rest assured, that nothing happens but by the will of an all-wise, all-powerful, and perfect Being, who directs them all for the good of the universe. In a life so short as ours, we have no occasion to know more: this ought to be sufficient to induce us to bless and adore him who is the author of all those wonderful phenomena which are so far above our comprehension.

But O my God! I ought likewise to bless thee, that I was not born in those superstitious and ignorant times, when whole nations were thrown into consternation and terror by these northern lights. To their disturbed imaginations this magnificent sight painted whole armies, and battles fought in the air! Hence they drew the most dreadful prognostics. To them the Aurora Borealis was a prophet which predicted, sometimes famine, sometimes war, and at others epidemic disorders.

But I behold in the mild and majestic splendor of this light, a display of the wisdom and power of my Creator. I am not terrified by those celestial lights, because I do not conceive that God has created any thing with a view of tormenting his creatures. And though these phenomena have but little influence upon our country, yet they may be of great advantage to the inhabitants of the North.

March 6.

On the extreme smallness of certain Bodies

The astonishing depths of space, the vaulted sky, and its unlimited extent, those vast orbs which shine in the heavens, the endless variety of creatures which cover our globe, and which fill the waters and the air; all these declare the glory of God, and tell us his power is infinite. But we must not suppose that the power and wisdom of the Creator is no where visible but in these large bodies. The greatest subjects of admiration are to be found in the most inconsiderable parts of the natural world. Even the construction of a grain of sand, viewed through a glass which magnifies objects a million of times is enough to fill the greatest mind with wonder. Who would suppose that in a grain of sand, which the eye can scarcely discover, there should be a living insect? If you examine with a microscope the mould of a piece of bread, you will see in it a thick forest of trees, on which you may distinguish the branches, leaves, and fruit. Even in your own body, you may perceive objects of inconceivable smallness: it is covered with innumerable pores, of which only a small part can be distinguished by the naked eye. The outer skin resembles the scales of a fish; and it has been calculated, that a grain of sand would cover two hundred and fifty of these scales, and that one single scale would cover five hundred of those pores which give passage to the sweat and insensible perspiration. Did you ever observe the wonderful

construction of the hairs of your head? However inconsiderable they appear, they are one of the Creator's master-pieces: each hair is a hollow tube, and has its roots, a substance full of marrow, and several small threads, by which they are united. In that scale which food leaves upon the teeth, a great number of little animals have been discovered; and it has been found that a million of those animalcule are contained in a space not larger than a grain of gunpowder.

Ought not these things to humble us in our own eyes, and to enlarge our ideas of the Supreme? How many things in nature are still wrapped up in mysterious shades! Perhaps there are multitudes of wonders in our own bodies, which we have neither thought of nor suspected. What little we do know, ought to serve to convince us that in small things, as well as in great ones, the divine perfections are admirably manifested. Not only the expanse of heaven, the splendour of the sun, and the fury of the tempest, but even the sand in the sea, declares the glory of God. The trees in their magnificent clothing, the grain, and all seeds in their minuteness, and even the meanest worm, cry aloud with one voice, "It is God who hath made us, and glory be to his "name!" Nothing so mean, but it reminds us of his greatness. Lord, I admire thy power and wisdom in the formation of the gnat, as much as in the wonderful construction of the elephant; in the form of a blade of grass, as much as in the high and majestic oak; and in a grain of sand, as well as in the largest mountains. Whatever thou hast formed, is for that reason worthy of my observation.

March 7.

On the gradual subsiding of Winter.

That divine wisdom, which at the beginning of winter causes the cold to come on gradually, has ordained that it should also diminish by degrees. Already does the sun stay longer above the horizon, and reflect more heat upon the earth. The nights now are only attended with a white frost, which vanishes with the noon-day sun. The fogs and vapours are dispersed, or fall in fruitful showers. Now the seeds begin to shoot, and the branches which appeared dead begin to bud; even some blades of grass venture to spring out of the earth. Nature is about to restore verdure to the fields, leaves to the trees, and flowers to the gardens. Silently does she labour to bring back the spring, though still opposed by storms of hail and frost nights. Soon will she accomplish her end, and the earth will shine again in all her beauty of youth. Nature works her changes gradually: effect succeeds effect, though unobserved by us, till the purposes of God are fulfilled. Many springs must be put in motion before a bud can blossom, or a blade of grass can shoot. Storms, rain, frost, and snow, were all necessary to rest nature, that her strength may be recovered. We now begin to see the happy consequences of winter, and should acknowledge the kindness of the Creator.

As the seasons vary, so do the periods and events of our lives. But all the events of our lives are linked together in a way which nothing but time can discover. Perhaps I see at pre-

sent why God caused me to be born of such parents rather than others: why in such a town, and not in another: why such particular events happened to me, and why it was necessary I should embrace such a calling in preference to any other. But all this was once a mystery to me. Now I see that the past was necessary for the present, and for the future; and that many events which did not seem to agree with the plan of my life, were nevertheless indispensable to render me as happy as I now am. And the moment is hastening when all the events of life will be laid open and explained. Perhaps the winter of life is just at an end, and I may now be on the point of entering a new world. When this moment arrives, grant, O God: that my soul may then overflow with hope and joy. When all the visible creation disappears from my view, grant me a glimpse of a blessed eternity: and give me such a foretaste of it, as shall raise me above all things earthly and perishable, and make me long to enter upon it.

March 8.

The Human Body with regard to its exterior parts.

As nature does not yet appear in full beauty, and the fields and gardens afford no charms to invite me abroad, I will meditate on myself, and reflect on the formation of my own body. It will give me an opportunity of acknowledging the wisdom and power of God, and I shall at the same time learn to be sensible of the value of my life.

The head holds the first rank of all the visible parts of the body; not only for its beauty, but because it contains the principle of sensation and motion. All the passions and sentiments of the soul are painted on the face, which is the most beautiful part of the man. Here the organs of the principal senses are placed, by the means of which we receive the impressions of outward objects. The motions of the lips and tongue, whether they touch the teeth or the palate, serve for articulation, and enable us to give so many different inflections to the sound of the voice. We can either grind or cut our food with the teeth; and the glands in the mouth serve to furnish the saliva necessary for digestion. The head being placed on the neck, moves different ways, as on a pivot, in order to turn in any direction as occasion requires. The shoulders are so formed, as to bear heavy loads. To them the arms are fastened, on which hands are formed in such a wonderful manner, that they perform any movements, as to touch, to take, to raise, to push away, and the like. All the joints and bones support and assist the different motions. In the chest are contained, and guarded, the heart and the lungs, and for that end it is composed of strong bones and ribs. The chest is separated from the belly by the midriff; and in the belly are contained the stomach, the liver, the spleen, and the intestines. The whole of this mass rests upon the hips, the thighs, and the legs: which also have several joints to make the motions easy. The whole is supported by the feet: the toes serve to fix the foot firm on the ground. The whole body is covered with flesh and skin, and the

hair of the head serves to guard it from the bad effects of the cold. Though these parts are so various, yet they are only the principal and essential parts of the body. They all afford, from their form, construction, order, situations, motions, and harmony, incontestible proofs of the wisdom and goodness of the great Creator. No part is imperfect or useless, nor so disposed as to hurt the rest. Were we, for example, deprived of the use of our hands, or had we fewer joints, we should not be able to do many things which we do now with ease. Were we to become quadrupeds or reptiles, and yet preserve our reason, we should notwithstanding be unfit for trade or arts; as we could not act, move, or turn as we should wish. Had we but one eye in the middle of our foreheads, we could not at once see to the right or left, nor take in so large a view, nor distinguish so many objects at a time. In short, all parts of the body are so constructed and placed, as to concur to the beauty and perfection of the whole, while each is well adapted for the purposes for which it was intended.

Let us therefore bless our Creator, who has so fearfully and wonderfully made us; and may we never lose sight of our dependance upon him!

March 9.

On the hope of Spring.

We are every day approaching nearer to the pleasures of spring, when we hope to breathe more freely, and to contemplate the works of nature with

more satisfaction and delight. This is one of the few expectations which does not deceive us, being founded on the invariable laws of nature. All, without distinction, feel the charms of this hope; for the beggar as well as the king may behold the spring approach with pure joy, and delight himself with the pleasing prospect. The spring procures us a thousand new pleasures; the beauty and perfume of the flowers, the sweet singing of the birds, and in all places the cheerful prospect of pleasure and joy. While most earthly objects are attended with anxiety, that of spring is as satisfactory as it is innocent and pure; for nature seldom deceives, but on the contrary, abounds with blessings beyond our expectation. Let us therefore, even in the boisterous days of March, give ourselves up to the sweet hope of spring, and the pleasure it inspires. Winter would have been insupportable without this comfortable prospect, which we now begin to realize. In a few days the sky will become serene, the air milder, and the sun will revive all nature.

I thank thee, O most merciful God, for the sources of joy and comfort thou hast opened to us, to soften the ills and cares of life. With great tenderness thou throwest a veil over the future evils which are to happen; whilst thou givest a distinct view of the pleasures and blessings designed for us! What would this world be without hope, but a vale of misery! Thanks to thy name for such a companion through our pilgrimage! This opens to us a cheerful prospect of futurity, when all around is gloomy; by this we are revived and enabled to walk contentedly through the sorrowful paths of life. O

heavenly Father! thou hast thus raised my dejected soul, and animated my courage when ready to fail! Thou hast taught me to hope for something beyond the present life; thou hast given me a hope full of immortality. And what would be the happiness merely of this life, if we did not enjoy the delightful hope of eternal happiness? Being possessed of this, let us reckon the evils of this life as nothing. However long and severe the winter of life, let us hope for spring, and wait the renewal and perfection of existence in the future world.

March 10.

On White Frost

At this season it is very common for trees and bushes to appear as if they were covered with sugar. The white frost is nothing but frozen vapours, which lose their fluidity when they touch other bodies. However imperceptible it may be, there falls a dew every day; this is rendered fluid by heat; but it easily loses its warmth when it touches bodies much colder than itself. The bushes must lose more heat in the nights of spring than the thicker branches: consequently it is natural that the small twigs should be covered with frost, when the others are free from it. When the dew falls on bodies considerably colder than itself, it instantly communicates its warmth to them, and of course the dew having lost the cause of its fluidity, its parts connect, draw close, and form a thin coat of ice. It is therefore easy to comprehend how it happens sometimes that our hair is covered

with frost. The breath from the mouth and nose, if it settles on hair, and be exposed to a very cold air, occasions this sort of congelation. In the same way, we may also account for the shining threads often seen on buildings in winter. If the walls are to a certain degree cold, the watery vapours which are settled on them condense and freeze; but if the cold be extreme, and it freezes hard, this effect does not follow, because the vapours are already frozen in the air; and if they light upon the wall, they cannot remain there, because they only touch it with some of their parts. It sometimes happens, however, in hard frosts, that the wall becomes white, as if covered with snow; this is a certain sign that the severity of the weather is going to abate. Let us here acknowledge the wisdom and goodness of God. All the effects of nature being under his direction, tend at all times for the general good and fertility of the earth; and as every phenomenon in each link of the vast chain of creation tends to the perfection of the whole, it is reasonable to acknowledge the smallest parts, and to praise his name for every blessing he bestows upon us.

MARCH 11.

On the various means which contribute to the fertility of Nature.

VARIOUS means are used by divine providence to render the corporeal world fruitful. Sometimes heavy rains are poured from the clouds, in order to purify the air from hurtful vapours, to soften the

earth and render it fruitful. Sometimes soft and plentiful dews, in a great measure supply the want of rain, and revive the plants that were ready to wither. Each season, in consequence of the wisdom of providence, has peculiar means of enriching the earth. The snow in winter preserves the earth from the cold, and at the same time, by the salts it contains, renders it fruitful. The storms of wind in the spring purify the air, dry the earth, or disperse the rain over the whole surface of the globe. Though thunder storms fill the timid with terror, yet they are accompanied with the precious blessings of the Creator. It may justly be asserted, that there is no revolution in the air or on the earth, which does not, one way or other, contribute to the fertility of our globe. Even those plagues which entirely destroy some countries, are but partial evils, which help to fulfil the beneficent views of the Creator; and on the whole the world is benefited by them.

O all wise and gracious Creator! I acknowledge that thy tender care is universal; Thou art Lord of all times and seasons! Let thy name be praised from the orbit of the earth to the heaven of heavens! As our globe rolls in the starry space, it is sometimes strewed with flowers, sometimes covered with snow; here adorned with vines, and there crowned with ears of corn. As it rolls it sings thy praises, O God, and joins the harmony of the spheres. When the fields in winter are changed into deserts, when the tempest roars, when the lightnings fill guilty mortals with terror, when countries are deluged, and when all the elements seem to threaten the destruction of the world; even then, thou art pre-

paring for the inhabitants thereof health, joy, peace, and plenty.

Here I would view the different means by which God renders the moral and spiritual world fruitful. In order to convince men of sin, of righteousness, and of judgment to come, God sometimes makes use of violent means. Sometimes he punishes the sinner severely, lays heavy judgments upon him, and of long duration, in order to rouse him from his slumber. He speaks to hardened transgressors as to Israel on Mount Sinai, with lightnings and with the voice of thunder. To others he applies opposite measures: they are snatched from the ways of sin and vanity, and drawn to him by the cords of love. Of this I am a living witness. Blessed be thy name, O Lord, for the gentle ways by which thou hast drawn me to thyself. Sometimes thou hast indeed chastised me, to humble my pride, and to lead me to reflect on my sins. At other times thou hast loaded me with blessings, and, like the refreshing rains of spring, thy mercies have fallen abundantly upon me: yet what poor returns have I made! How little fruit have I produced! Alas! my heart is often like a rock, which no thunder could move, no rain could soften. Lord! soften me, render me more docile and obedient! O grant me repentance unto life! This, Lord, is the only favour I will ask: let my whole soul be renewed by the power of thy grace. Use what means thou pleasest, gentle, or rough, only make me a sincere believer, and grant that I may be fruitful in good works.

March 12.

Advantages derived from the Sea.

Some may be ready to fancy, from a superficial view of the earth, that there is not a just proportion of land and water. It may appear at first sight, as if the immense quantity of water which takes up so great a part of the globe, were inconsistent with the idea we have of the divine wisdom and goodness. Perhaps we think it might be more advantageous, if God had changed into firm land the enormous space which comprehends all the seas, the lakes, and the rivers: but here we only betray our ignorance.

Were the ocean reduced to half what it is, it would produce only half the vapours it now exhales; consequently the earth could not be sufficiently watered; for the quantity of rain which falls is in proportion to the surface of the seas, and the heat by which it is drawn up. Thus it is wisely ordained, that the sea should be large enough to supply the necessary vapours for watering the earth, which would not have been the case had it filled a less space. Were the extent of the sea more confined, there would be more deserts and barren countries, because there would be fewer rivers and less rain. But how could commerce be carried on, if the sea did not exist? Different parts of the globe are dependent on each other in some measure; God intended there should be an intercourse between all nations. For this purpose the earth is intermixed with seas, that communications might be opened between nations which are the most remote from each

other. Had we no other means but horses and carriages, how could riches and treasures be carried from one part of the earth to another? In this division of the globe into land and water, I can see new proofs of the Creator's wisdom and goodness. Whatever distance I am from the sea, I am daily benefited by it.

O why are we not more thankful for this blessing! As the earth and the seas declare the glory of God's attributes, why do we not glorify him more? My heart, Lord, through thy grace, is disposed for this noble work. Let thy holy Spirit assist me, that my grateful praise may be acceptable. Though I, though all men, should forget thy mercies, the sea itself would bear testimony of thy power, and be the messenger of thy wondrous goodness.

MARCH 13.

On the difference between Plants and animals.

So great is the difference between plants and animals, and it is so visible, that it requires but a little observation to be convinced of it. One remarkable difference consists in the animals having the faculty of moving from place to place; which faculty the vegetables are totally deprived of. The faculty of feeling is a much more essential difference. To this we may add, the manner of being nourished, which is still another distinction between them. Animals can choose their proper food; on the contrary, plants are obliged to take what nourishment the earth affords them, without any choice. This

they receive from the moisture of the earth, by the action of the veins in the leaves, which imbibe the nourishing juices with which the air is filled. There is a much greater number of speices in the animal than the vegetable kingdom; neither have the animals so much conformity to each other as the plants have, and whose resemblance makes it very difficult to class them. Another circumstance which makes their difference, is the manner in which they propagate their respective speices, which is distinct from each other, notwithstanding the similarity found between them. They differ likewise as to the places where they live; plants can only grow and multiply on the earth; most of them rise above its surface, and by roots are fastened to the soil. Some indeed are entirely under ground, and some few in the water; but in order to live they must necessarily take root in the earth. On the contrary, animals are less limited in place: the surface and the interior parts of the earth are filled with them. Some even inhabit the sea; others live at a considerable depth in the waters. Millions live in the air, in vegetables, in the bodies of men and animals, in fluid matter, and even in stones. Animals and plants differ too in respect to size: there is a much greater difference between the size of a whale and a mite, than beween the largest oak and a bit of moss. But the most striking difference lies in the various forms of plants and animals. In this respect, animals have so distinct a character, that they cannot possibly be confounded with vegetables. But let us not presume that we have perfectly discovered the limits which divide the animal from the vegetable

kingdom; or that we have found out all by which they are distinguished. Nature, to render her works beautiful, makes use of almost imperceptible shades. Perfection increases successively in the chain of beings, and rises by millions of degrees; so that the difference is very small between a more perfect being and that which preceded it. How short is the distance between the plant and the animal! Some plants appear sensible, while some animals seem almost deprived of sensation: this is evident from experiments made on coral. It was thought once, that corals were sea plants; but now there are strong reasons for placing them among the animals: for what was then taken for a flower, appears to have been an animal. These observations may serve to convince us of the impossibility of fixing the exact limits in the kingdom of minerals, vegetables, and animals. Hence we may learn, that the world, with all its inhabitants, is the work of an infinite Being. Such astonishing variety, with so much uniformity, can proceed from none but the almighty, omniscient, and perfect Being, who is the arbiter of nature, and who formed all things out of nothing. O may our hearts rise towards him. Let us observe the gradation from the stone to the plant; from the plant to the brute; from the brute to the man; from the man to the angel; and then let us take our flight toward the eternal, the incomprehensible God, the Creator of the world, the Preserver of plants, the Protector of animals, the Father of mankind, and the King of spirits. If possible measure his greatness, and try to sound the depth of his wisdom. Thrice holy Being! we creatures are too

weak to know thy works. They are immense; and to number them all, requires an infinite mind like thine own! While I reflect on thy greatness, may I imitate thy goodness. All creatures are under thy merciful care: thou art good to all, and thy tender mercy is over all thy works. Here may I imitate thee also: let me never be cruel or tyrannical to creatures which appear to be meaner than myself. May I use thy creatures as not abusing them.

March 14.

On the uniformity and variety in the works of nature.

The earth under our feet, and the sky over our heads, remain always the same from age to age; and yet, now and then, they afford us spectacles as varied as they are magnificent. The sky is often covered with clouds; sometimes it is serene, sometimes blue, and sometimes of variegated colours. The light of noon day, and the darkness of night, the splendor of the sun, and the faint light of the moon, regularly succeed each other. Sometimes the immeasurable space of the heavens appears a desert, and sometimes it is strewed with an infinite number of stars. The earth also is subject to a great many revolutions. During the winter, it is without beauty and ornaments; in the spring, its youth is renewed; in autumn, every kind of fruit is poured upon us in abundance. How different also is one country from another! Here plains extend beyond the limits of

our sight; there high mountains, crowned with forests, rise to the clouds. At their feet, rich valleys are watered with rivers and brooks. Here are still lakes, there are gulphs and precipices, and a little further impetuous torrents. Every where the eye is pleased with variety, and the heart is opened to sensations of pure delight. There is the same assemblage of variety and uniformity in all the vegetables on our globe. They all take their nature and their food from their common mother; yet what a vast difference between a blade of grass and an oak. They are all ranged under certain classes; indeed those of the same species have a strong resemblance to each other, and yet what observable difference we see in them! The same may be said respecting animals: they also are divided into classes, and they still preserve resemblances, however various they are. There is a certain degree of conformity even between man and the lowest class of animals: he has the same means of food, and is warmed by the same sun. Animals and men are like plants; they grow, ripen, fade, and die. But what diversity and conformity is found in the human species? Human nature, in all places and times, is the same; and yet we find, that each individual throughout the world has a form, talents, and countenance, which serve to distinguish him from any other. It seems as if the Creator was pleased with variety. All creatures on our globe are divided into three classes: vegetables, minerals, and animals. These classes divide themselves into kinds, and the kinds into a great variety of individuals. Hence it is, that there is no creature on earth alone,

or without resemblance to its own species. Thus you see the beauty and order of the universe: and it is impossible to change the order which God has established. Let us then fall down and adore the infinitely wise Creator

March 15.

On Seeds.

Though all vegetables spring from seeds, yet the greatest part of these are not sown; and many of these are invisible to us. They are dispersed by nature; which with this view has furnished some seeds with a sort of down, or little feathers, which serve as wings for the wind to carry them away and spread them abroad. Other seeds in consequence of their own weight, fall perpendicular upon the earth, and sink themselves into it. Others that are larger and lighter, are furnished with a sort of small hooks to catch with, to prevent their being carried too far from their place. Some are inclosed in elastic cases, in which they are carried to more convenient places. What is still more admirable, is, that some birds seem to have the care of planting trees: by them nuts are often sown, which afterwards shoot and grow. Ravens have been known to plant oaks in the following method: with their bill they make a hole, and drop an acorn in it, which they then cover with earth and moss. Certainly their intention is not to plant trees: they are prompted by instinct alone: the acorn they bury for their food, and it shoots and becomes an oak. Many

seeds are swallowed by the birds, and are thus scattered on the ground, where they take root, shoot, blossom, and bear fruit.

Here we ought to admire the wise and tender care of divine providence. Had the sowing of seeds in fields and forests been left entirely to mankind, in what a condition would they be? Observe how the grass and flowers spring up at the return of spring, by which the earth is adorned, without any care and assistance of ours. Merciful Jehovah! how great is thy love to thy creatures! how much is thy wisdom to be admired! It is further to be remarked, that the whole plant, however large, is at first concealed in the narrow space of the seed. Thus the tall oak, with its branches, leaves, and root, are already in the acorn: and as the propagation and preservation of all species greatly depend on the seed, God has taken care for its protection. Those plants which can endure the cold of winter, how carefully are their blossoms and seeds inclosed in buds: and those which cannot endure the severe cold, are preserved under ground by their roots or fruits, till the mild warmth of spring causes them to vegetate and spring up again. In short, every seed is protected and preserved in a way most suitable to its nature. Every where we may trace the hand of the Eternal: his wisdom and goodness shine throughout all nature.

MARCH 16.

On the magnitude and distance of the Sun.

HAD we never been made acquainted with the extreme smallness of our globe, perhaps we might

feel it in a very sensible manner, by reflecting on that immense body which communicates light and heat to many other worlds. The sun, being nearly in the centre of the planetary system, may be termed the monarch of sixteen worlds: for the primary and secondary planets are evidently worlds, which receive their light, heat, and internal motion from the sun. This alone proves its prodigious size; which is further confirmed by its visible greatness, notwithstanding its immense distance from us. But if the calculations and measurements of astronomers are to be admitted, the diameter of the sun is at least a hundred times larger than that of the earth. Opinions vary as to its distance: it is now generally allowed to be one hundred millions of miles! Some planets indeed are nearer to it; but probably if our earth were in their situation, it would be reduced to ashes. On the other hand, were our earth as remote from the sun as some of the planets, it would be involved in frightful darkness, and could not be habitable by such creatures as now dwell upon it. Nevertheless, there is reason to believe that all those worlds, whatever be their distance from the sun, are adapted by the great Creator for rational and brute inhabitants. Perhaps their atmosphere is different, or their nature is so formed that they can endure the extremes of heat and cold. Possibly what has been said of the size and distance of the sun may appear extravagant; for nothing appears to us so large as the earth we inhabit. But the sun is a million of times larger than the earth. At such a distance it appears small, and thence it is that we are more ready to credit our eyes than our

reason. Had God placed us on a planet as much smaller than the earth as it is smaller than the sun, the size of the earth would appear as unlikely to us as that of the sun does. It is no wonder then that we should be amazed when we reflect on the size and distance of that body. It was not, however, placed in the heavens merely to excite our admiration. We ought to look to that great Being who forms, guides, and preserves, the sun and all things else. The greatness of the sun is but a speck, a nothing, in comparison of HIM; and its vast light is but a shadow, when compared with the dazzling splendor of our God. How amazing his greatness! We are lost in reflecting upon his incomprehensible greatness and glory. If in comparison of the sun the earth be so insignificant, what must it be in comparison of the Creator? and how great the distance between us and infinity! Who is like unto thee, O Lord! who can compare with thee! Thy greatness exceeds our praise. The most sublime understanding cannot reach thy height. Thou art the life and light of every being! Splendor, majesty, and glory surround thee! Thou art decked with light as with a garment! The sun is the master-piece of the Creator: every time we feel its salutary influence, let us praise the Lord. The proof it gives of the greatness of God, should teach us how worthy he is to be adored and loved above all things In him too may we place unlimited confidence! Let the sun remind us of our divine Redeemer, that Sun of righteousness, who visited us in our misery, and brought healing in his beams. An interest in him is as necessary to our salvation, as

the influence of the sun is to our natural life. We should have sunk in everlasting darkness, in sin, misery, and despair, had he not, by his obedience, brought life and immortality to light.

March 17.

On the imperfection of our knowledge in regard to the things of Nature.

Why are we not endowed with faculties for a more comprehensive knowledge of nature? We are ready to think we could better admire the greatness of God, and glorify him more, could we take in the whole, could we know the perfection of each part, and discover all the laws and springs of nature. If the imperfect view we now have, leads us to admire and adore the Creator, how should we be lost in wonder and praise if we could comprehend the whole! But possibly we may be mistaken in this opinion; at least we ought to consider that we may now glorify him more in proportion to our powers, than we should have done had our capacities been larger. We ought not to be surprised, that we cannot in our present state discover the first principles of nature. Our organs do not possess sufficient strength to penetrate into the source of things; nor can we form ideas of invisible objects: but the world swarms with objects which my senses cannot distinguish. My imagination is lost when I try to reflect on what is infinitely great and infinitely small in nature. The velocity of light eludes my senses; nor can imagination keep pace with it. I feel most

sensibly the weakness of my faculties, when I think of the circulation of blood in the veins of animals, whose bodies are known to be a million times smaller than a grain of sand! Now as nature descends so low, and rises so high, is it any wonder I cannot discover the true principles of it? But suppose we possessed powers sufficient to take in the whole chain of the universe, to penetrate the deep recesses of nature, and discover all its laws, what would be the consequence? Certainly we should at first be filled with admiration; but it would not last long. So inconstant is man; that he seldom admires a thing longer than it is above his comprehension. Had we a clear distinct idea of the whole system of the creation, perhaps we might be vain enough to think we could form a plan like it; and we might be too much elated, and become more proud of our imperfect knowledge, we ought to bless God for it. Could we see further into the things of nature, we might be less grateful than we are at present; and perhaps too it might diminish our pleasures in contemplating the works of God. But as we have at present only learned the first rudiments of the book of nature, we feel our own insignificancy, and the infinite greatness of the Creator. Every new discovery ought to fill us with new admiration of the wisdom and power of God.

MARCH 18.

On the use of Vegetables.

THE great number and variety of vegetables, like all things else, display the beneficent views of the

Creator. The advantage and happiness of his creatures, was no doubt his grand end in covering the earth with so many different herbs, plants, and fruits. So great is the number, and such the variety of plants, that thirty thousand species of them are reckoned already; and every day makes new discoveries in this respect. There is no bounds to their increase. For instance, who would not be astonished, that one grain of wheat should in some instances, produce two thousand others? and that one poppy-seed should, in two or three years time, produce enough to sow a whole field with it? This prodigious increase of plants was doubtless designed for the benefit of all mankind; the early use of vegetables clearly evinces this. By plants and fruits we are daily furnished with the most wholesome nourishing food. Are we not indebted to the vegetable world for most of our clothes, furniture, and houses? All the parts of plants are useful. From the root arise medicaments, food, and fuel to make pitch, dyes, and utensils of every kind. Buildings, charcoal, fires, and many other things, are made from wood: even the bark is useful in medicine, and for tanning. The ashes is necessary for bleaching cloth, manuring land, and making saltpetre; and pot ashes are used in dying. Pitch and tar are made of rosin; and rosin is used for the purpose of varnishing, soldering, and rubbing the bow-strings of musical instruments, to render them more sonorous. Turpentine is used in medicine; and mastic in perfume. Flowers, both by their colour and smell, please and delight; and are very useful in furnishing bees with wax and honey. Every one knows how useful the various fruits are, either raw.

baked, dried, or preserved. But vegetables are more useful for animals than for man; for the former chiefly subsist upon them. O bountiful Lord! where can we find expressions to celebrate thy goodness? Thou openest thy hand and satisfieth the desire of every living thing. Perhaps there is not a plant upon earth that is not of some use. What then should be our gratitude, when we view a field, a meadow, or a country? May I taste and see that the Lord is good:—blessed are all they that put their trust in him!

MARCH 19.

On the marvellous construction of the Human Heart.

How astonishing is the formation of that musculous body, situated in the cavity of the breast, and called the heart! It is formed something like an obtuse pyramid, and is so placed, that the point inclines a little to the left side. It appears to be a substance of fleshly fibres, interwoven with infinite art, and in such a way that the external fibres, extend from the left side of the heart towards the right. The heart has within it two cavities, called ventricles, separated from each other by a fleshy partition. In this partition there is a vein, which conducts the blood of the upper parts of the body into the right ventricle of the heart; and another which conducts the blood back from the lower parts into that same cavity. There is also an artery which sends it from thence into the lungs; besides

another vein through which it runs from the lungs into the left ventricle, from whence it is sent through the great artery over the whole body. There is a sort of musculous bag on the one side of the right ventricle, which is termed the auricle of the heart; and which receives the blood before it enters the right ventricle. Another auricle, equally useful, hangs on the right ventricle, to retain the blood there during a new contraction. The blood all passes through the heart. It is constantly passing in and out; and by the contraction of the heart it is sent into every part of the body, and circulates through all the veins. The heart is in perpetual motion, from the first to the last moment of life. In a state of health, it contracts itself at least sixty times in a minute; and by consequence three thousand six hundred times in an hour. At each beating of the pulse, it throws out about two ounces of blood. It must use a considerable force to do this: the weight resisted in twenty-four hours is incredible.

These things are all equally admirable, and incomprehensible. We may well exclaim, How great is our divine Creator! How indescribable is his glory!

March 20.

On the change of Seasons.

In the hottest and in the coldest climates, there are but two seasons of the year really different. In the coldest countries, they have about four months

summer ; when in consequence of the length of the days, the heat is very great. They have eight months winter. They have scarcely either spring or autumn ; because in a few days, extreme cold is succeeded by extreme heat : in autumn it is the reverse. In the hottest countries, there is a dry and burning season for seven or eight months. This is succeeded by four or five months rainy weather, which makes the difference between winter and summer. It is only in the temperate climates that there are four different seasons in the year. By the gradual decrease of summer heat, the fruit have time to ripen by degrees, without being hurt by the cold of winter ; and in spring, the plants have time to grow insensibly without being destroyed by late frosts, or hastened too much by early heats. These four seasons are most perceptible in Europe, especially in Italy and the south of France. As we advance by degrees north or south, we perceive less of spring and autumn. February and April are generally very uncertain as to weather. The depth of melted snow and rain, were they not to evaporate or fall away, would in most countries rise annually to the height of a foot. How admirable is this change of season ! It cannot possibly be attributed to chance : for there can be neither order nor constancy in fortuitous events. The seasons are as regular as day and night. The earth is successively adorned with leaves, flowers, and fruit. Then again it is stripped of all its ornaments, till the return of spring revives it, and supplies its inhabitants with the necessaries of life.

O my soul! awake to praise thy God! That delightful season is now commencing which opens such an agreeable prospect before us, and makes amends for the dulness of winter. Spring draws along with it innumerable blessings. How many that hoped to see the return of spring, in which they expected to recover strength, have died before the winter was over. But I am favoured above millions; I still live, and may indulge the joy with which the spring inspires me. But how many springs have I lived, without acknowledging the goodness of my Creator! and probably this is the last spring I shall see upon earth. Perhaps before the return of the equinox I shall be in my grave. Let this thought teach me to walk circumspectly, redeeming every moment of this transitory life.

As the seasons follow in nature, so do they in our lives; only with this difference, those which are past never return: the spring of life is over with me. The summer and autumn of life are coming on, when I ought to bear fruit to the glory of God. Perhaps I may die in the vigour of life, and never attain to the winter of old age. O Lord! thy will be done! Only grant that however short my life, it may be devoted to thy glory

March 21.

On some things which appear useless.

That divine providence by which the world is governed, is universal, and extends to the minutest

things, and to events the most trifling. Yet how many things are there in the world which appear useless? By the north wind, trees are blasted, and their blossoms are dispersed and become useless. Multitudes of insects appear not only useless, but hurtful to men, to beasts, and to vegetables. Many men and animals just shew themselves upon the earth, and disappear: others are born monstrous and deformed, or become impotent. Many faculties appear to be lost for want of an opportunity to make them useful. Many of the best undertakings fail before they come to maturity. Some may ask, Could all this be, if an infinitely wise Being governed the world? But who are they that dare question the wisdom of divine providence? Are they sure they are right? Do they know all things well enough to see their connection with, and dependance upon, each other? and to say with certainty, "This is absolutely useless, or answers no good purpose?" We should remember how limited and weak our understandings are. It becomes us to observe a respectful silence; not to criticise, but to adore, when we reflect upon the works of the Lord, who has done all things well. Besides, many things may be useful in different ways. Certainly the insect devoured by the swallows cannot produce a new generation, yet it serves as food for the swallow. Though our tears cannot soften the cruel man, yet they are not lost; they serve to keep up the sensibility of our hearts: and beside, they shall not be forgotten before God. Blessed are the merciful, for they shall obtain mercy. Do not let us think

then, that there is any thing in the world entirely useless. All things answer the end proposed by God, and exactly in the way too which he determined on before the world was. True wisdom not only attends to the present, but extends to the future : and it is the connection which one thing has with another, that renders them in many cases subservient to some good end. Each being has a share in the vast plan of the Creator : but the part which belongs to some beings is so small as to be imperceptible, and so may entirely escape our observation. But we ought not to infer, that they are therefore useless or hurtful. Let us be persuaded that God is infinitely wise, and that he acts by a well-formed plan : this will contribute to our peace and happiness. Daily events transpire, for which we cannot account : and then perhaps our confidence in God is weakened. Let us learn, however, from daily experience, and from the dispensations of providence, the wisdom and equity of the government of God : this will render our minds tranquil under all the vicissitudes of human life. We shall then be persuaded, that in all that God does, or permits to be done, he has wise ends in view. Instead of finding fault, let us constantly adore his wisdom, and render glory to his name. All events will justify that Being who has never been mistaken in the government of the universe ; and of whom we are assured, that as the Judge of all the earth he will do right. A proper belief of this will tranquillize our minds here, and render us happy hereafter.

MARCH 22.

The harmony between the moral and physical world.

IT is wisely ordained, that there should be a great affinity between the world and its inhabitants, to shew that they were made for each other. There is a perfect harmony and beautiful connection in all the works of God. There is a near relation and striking analogy between human nature and the surface of the earth. Like plants and animals, men grow, arrive at maturity, and die. As the diversity of soils and climates is great, some fruitful, and others barren, so is there as great a variety in the minds, talents, and faculties of men. And there is in this variety more wisdom and goodness than perhaps we are at first aware of; had we a thorough knowledge of things, we should find that a glorious perfection reigns in the whole. Should any object, that God has not given the same faculties and the same degree of understanding to all mankind, we might reply, Who art thou, impotent and blind mortal, that presumest to question the Almighty as to what he has done? Beyond all doubt this difference is right and worthy of our admiration; though it may not be conformable to our way of thinking. The most savage and uncultivated nations, like barren and desert countries, have their beauty and use in the eyes of the Creator. Divine providence has evidently intended the earth for cultivation, that it might yield support for his creatures. So it is his intention also, that human nature should be culti-

vated; that our souls should be made fruitful in every good work. With this design, God has revealed his mind and will to mankind in the holy scriptures; but unless the soil be disposed to receive this good seed, it will be as if sown among thorns, or by the way side.

Vast countries still lie barren and uncultivated, though nothing is withheld from them that is needful for rendering them fruitful. And thus it is, notwithstanding the publication of the gospel, there are still many millions who remain in ignorance. Even in the most enlightened nations of Christianity, the glorious gospel is not universally known. Many do not comprehend it, and are quite insensible of the salutary truths of our holy religion. Some appear to receive these truths with eagerness and joy; but soon lose their impressions: with others, the pleasures, riches, and cares of this world stifle the divine word. A small number receive it with a good and honest heart. To them alone the gospel is the power of God unto salvation.

But what is my real character? What impression have the truths of Christianity made upon my heart? Let conscience reply with honesty and sincerity; and may my conduct through life prove that I am a real Christian!

March 23.

On the nature and properties of Air.

By air is meant that subtle and fluid body which surrounds our globe; and which all living creatures

breathe. Although it is so near us, and we are surrounded by it on every side, and experience its effects, yet we do not know its real nature. If we move our hands quick, and drive it towards our face, we shall find, however, that it is something corporeal. It is equally certain that the air is fluid, that its parts separate and yield to every impression; were it otherwise, we could neither breathe nor pass through it. The weight of air is very considerable, though it is a thousand times lighter than water. Any surface of a foot square, bears a weight of air equal to a thousand pounds. Hence a man six feet high, whose surface is about sixteen square feet, continually supports two hundred and eighty stone weight of air. Perhaps this may appear incredible; but it is the air within us which preserves a balance, and prevents us feeling the external pressure. Air is also elastic, and therefore constantly endeavours to extend itself into a larger space; and though it may be compressed, yet it constantly expands again as soon as the pressure is removed. By means of heat, air may be made to fill a space five hundred thousand times larger than it occupied before, and yet not lose any of its elastic force by this astonishing dilation.

These wonderful things are well worth our admiration; and we find in them the cause of many astonishing effects. The globe itself is supported by air, and the clouds borne up. Without it we could not breathe or exist. This element, therefore, also proclaims the rich sources of God's wisdom, goodness, and mercy.

March 24.

Nothing new under the Sun.

In respect to us, it is certain there happens many things new in this world. New flowers blossom every spring, and fruits ripen that we never saw before. Nature changes her scene every year; new events and new revolutions daily occur. But it is only in a relative sense, as it respects our limited understandings, that it can really be said, there is any new thing. What has been, will be, and what has been done, will be done again: and there is nothing new under the sun. God, whose understanding is infinite, has not seen it proper to multiply beings unnecessarily. He has formed as many as our wants, our pleasures, or our curiosity can require. So far from exhausting his works, we cannot even gain a superficial knowledge of them all. Our understandings are too weak and confined to form a just and perfect idea of all created beings. Hence we are sometimes ready to think, there are many things new, in consequence of the variety and diversity in nature. It is not necessary that there should be a continued creation to extend to infinity. It is enough that the Creator maintains the order he established from the beginning. All the springs of nature are in God, and his works are so varied, that they appear always new, even though they succeed each other, and return with the greatest regularity. Without presuming to sound the depth of creation, or attempting to take in its vast extent, let us be content to enjoy what God has created for our use.

As we cannot reckon all the works of God, we may learn that he is their author, and that our understandings are very confined. But have not late discoveries been made, which centuries ago were entirely unknown? Does not each kingdom in nature present to us phænomena that we formerly had no idea of? These discoveries are to be attributed more to our wants, than to our sagacity. As our wants multiplied, new means were necessary to supply them; with these means providence has supplied us, but they existed before we discovered them. The minerals, plants, and animals, which we have lately become acquainted with, existed in the bosom of the earth, or on its surface, before the enquiries and labour of man had brought them to light. It is certain that even many of the new discoveries of which we boast so much, were made, at least in part, by the ancients. Were the world the work of chance, we should sometimes see new productions; but no new kinds of plants, or animals, appear: and for this plain reason, all has been planned by infinite wisdom. His works are so perfect, that they need not to be renewed and created again. Nothing was made by chance; but all events have been determined by infinite wisdom, and are all linked together in one chain. The providence of God preserves the whole fabric of the universe by the concurrence of general and particular laws. Wisdom, order, and greatness are stamped upon the whole. God is praised and magnified in all and by all: to him be endless praises. Amen.

March 25.

On Caves in Mountains.

Caves are peculiar to mountains; and, like precipices, they are formed by the falling in of rocks; or like the abyss, by the working of internal fire. The same causes, therefore, which produce the quaking, opening, or falling in of the earth, may produce caves: viz. the explosion of volcanos, or the action of subterraneous vapours and earthquakes. But of what use are these caves, and why are they formed? Doubtless for wise purposes, even though we could not see their utility. But this is by no means the case: there the waters are collected, in order to be afterwards spread over the earth, and to moisten it when the rain fails. They also keep up the course of waters in subterraneous canals: when their circulation is stopped, it produces shocks of earthquakes, so terrible to mankind. They serve for vents for the air which is confined in the earth, which, if it could not get a passage, would corrupt, or lift up and shake the earth. Being filled with water, these caves often give rise to rivers and lakes. The lake Zermith, in Carniola, is thus formed. Sometimes it fills, and at others it is dried up or lost under the neighbouring mountains, in such a manner, as to be sometimes navigable, and at other times it may be ploughed. Many animals would perish if they could not find an asylum during winter in the caves of mountains. Were there no caves, we should be deprived of several minerals, and other valuable productions, which are formed

and brought to perfection in subterraneous caverns. Thus God has even here manifested his goodness and wisdom in a very sensible degree. There is nothing useless in nature: there is neither deficiency nor redundancy. The more we are employed in such researches as these, the more reason we shall see to adore the sublime perfections of God.

MARCH 26.

On the circulation of the Sap in Trees.

THERE is an insensible revival in the trees which appeared for several months to be quite dead. A few weeks hence we shall discover in them still more signs of life. The buds will enlarge, open, and produce their precious blossoms. Though we have had an annual opportunity of observing this revolution, perhaps we may still be ignorant of the means by which it operates. It is produced by the sap, which the air, and an increase of heat, put in motion into the stems of the trees. The life and growth of trees depend on the circulation of this sap, as the life and growth of animals on the circulation of the blood. Hence vegetables are so disposed and formed in all their parts, as to concur towards the preparation, preservation, and circulation of this nourishing juice. The bark is the principal means of raising the sap from the roots of trees, into their bodies, branches, and fruit. A multitude of small veins contain the juice, and render the circulation easy. These veins extend to the branches, and rise up the whole length of the tree to the top. By some

of these veins the sap is carried to the tops of trees, and by others it is brought down to the bottom. The ascending veins draw up the sap in the heat of the day, and it passes down the others in the cool of the evening. The chief use of the leaves is to make the sap circulate. Every part of the tree receives the benefit of this nourishing juice. But were there not openings at the top of the branches, the sap would not rise through them. The watery parts of the sap evaporate through these pores, while the oily, sulphureous, and earthly parts mix together to nourish the tree and promote its growth. When by any means the circulation is stopped, whether through age or accident, the tree dies.

Shall we look on the trees at this season, with our accustomed indifference after these reflections? Can we observe the renewal of all nature without thinking on that God who imparts life to every creature, in so many different ways? Alas! that we should be so inattentive to these wonders which are annually presented to our view: and yet this is too much my case. I have had many opportunities of observing this quickening virtue so visible in trees and plants; but I have thought as little of it as the animals that graze in the fields: and what is more wonderful still, I have been almost equally inattentive to my own growth and preservation. As I have once more the happiness of seeing the return of spring, let me think in a more reasonable way, and more like a Christian. May I at last acknowledge that beneficent Being, whose greatness appears through all nature. But all these wishes will be fruitless and ineffectual, unless thou, O God, art pleased to

incline my heart to acknowledge and glorify thy holy name. Whilst all nature is reviving, may my soul be quickened by thy divine Spirit. While the vegetables receive a new existence at this lovely season, may it be the signal to awaken me from my slumber, and lead me on to a life of true holiness.

March 27.

On our ignorance in regard to futurity.

Our ignorance of a future state arises partly from the narrowness of our capacities, and partly from the infinitely wise will of God. Knowing the strength of man, he would not give him more knowledge than he could bear. Knowledge is the same to the soul, as the light of the sun is to the eyes. Too great a splendor, instead of being of use, would dazzle and confound. It is not proper that we should know all future events, for it might endanger our virtue. Could we see into futurity, we might become wretched: for though future events might be agreeable and happy, yet their distance would render us dissatisfied with our present lot, and we should forget to be thankful for what we now enjoy. On the other hand, if future events were to be sad and melancholy, we should begin to suffer them before-hand, as soon as we had a view of them. The idea of the sorrows reserved for us, would render us insensible of present happiness, and incapable of enjoying it. God has therefore, in wisdom and goodness, thrown a veil over futurity, and gradually acquaints us with our destiny, as events turn

up. Do not let us anxiously wish to anticipate the happiness which awaits us, nor to feel the weight of afflictions before they happen. We ought rather to bless God, that by our ignorance he has spared us so many fears, cares, and sorrows. Why should we wish to pry into futurity? If we are but reconciled to God through the blood of his Son, we may depend upon it that all things shall work together for our good. Are not all things under the wise direction of the Almighty? He sees the end from the beginning. Let us, therefore, without being anxiously concerned, throw ourselves each night into his merciful arms, and not trouble ourselves about what may happen: let us trust in him also when we awake, without being anxious for the events which mark the day. Let us trust in the Lord. and do good, and no doubt he will provide for us, and turn all events which concern us for our advantage. As our day is, so shall our strength be. Whatever the wisdom of God has decreed for us, must necessarily happen: and he can neither err nor be unkind. Let us willingly drink the cup designed for us. Let us be fully resigned to the will of God; and then, whether we live or die, our portion will be the pure unmixed pleasure of paradise. Let our souls be calm then; God is our heavenly Father: he will guide us with his counsel, and afterwards receive us to glory.

March 28.

On the insensible approach of Night.

As the night in itself is to be considered one of the Creator's benefits, so it is wisely ordered, that

it approaches by degrees. A sudden transition from light to darkness, would be both inconvenient and frightful. The labours of men, in many instances, would be interrupted all at once by so sudden a change, which might be very prejudicial. Men and animals, yea, all nature, would be filled with terror, and the organs of sight would be materially injured. The night does not therefore come on all at once, but advances slowly; and our most pressing concerns may be finished by twilight. Thus we are not disturbed or incommoded by the approach of night, as we have timely warning to prepare for it. But what are the immediate causes of twilight at the end of each day, by which the melancholy appearance of the night is in some measure tempered and softened? Although the sun is withdrawn, a part of his mild lustre still reflects itself: how wise and beneficent are the plans of nature! This essential service is done us, by the peculiar form of the atmosphere around us. By means of it, the rays of the sun, which fall on its upper parts, are bent towards the earth; which would otherwise have been carried off in a straight line. By this means we are favoured with light much longer, and the time of labour is considerably lengthened.

Thus God has planned in the greatest wisdom, not only the great revolutions of seasons, but also the regular returns of day and night, in a manner the most advantageous to us. Let unfeigned gratitude daily arise to him for his mercies. The insensible approach of night, reminds me of the evening of my life, which comes on also by degrees, and the shades of death will almost imperceptibly surround

me. May the work appointed me to do then be happily finished. May I labour while it is yet day, to finish my task allotted me; for the night cometh in which no man can work.

March 29.

God's Works display his magnificence.

Why are all the works of God so magnificent and splendid? Why do all surrounding objects possess so many peculiar charms? Why are we every where furnished with new cause for wonder and admiration? Doubtless it is that we may perpetually admire and adore that great Being who is infinitely more beautiful, sublime, and magnificent than all which we most admire in nature. We may well say to ourselves, If the works be so great and so complete, what must their Creator be? If creatures possess such charms, how inexpressible the beauty and the infinite greatness of him who beholds the whole creation with a single glance? If our eyes cannot bear the dazzling brightness of the sun, is it any wonder that he who lighted up that globe should be incomprehensible, and dwell in inaccessible light, where mortal eyes neither have nor can behold him? God must be infinitely more wonderful than his works! Could we thoroughly comprehend his greatness, he would cease to be a God, or we should cease to be men. How must it then enrich our minds, and fill us with a treasure of ideas, to contemplate that God whose greatness and magnificence are so unlimited! Such reflections will in some measure prepare our souls, and render them capable of enjoying infinite

happiness. Perhaps our knowledge in a future state may bear some proportion to our acquirements here. While we study nature then, let us view it as a glass in which the image of that God is represented whom we cannot see face to face. Let us collect all the scattered beauties of nature, and when overwhelmed with astonishment at the view, remember that, compared with their Creator, they are less than a drop to the ocean. Notwithstanding the faults and imperfections of the creatures, they are covered with excellence: what then must He be, and how worthy of our admiration, love, and praise, whose splendour is more spotless than the purest light, more brilliant than the sun? Collect all thy powers, O my soul! to give thyself up entirely to the contemplation of the most adorable Jehovah! Rest not till thou hast soared even to the boundless perfection of that God who is raised infinitely above the most perfect of his creatures. Be it thy chief study to acquaint thyself with God, for no other knowledge can satisfy thee, nor fill thee with uninterrupted peace. It will be to thee a foretaste of that more perfect knowledge and boundless happiness, with which thou wilt be blessed at the foot of the throne, and through an endless eternity.

MARCH 30.

On the arrangement of the Seasons in the Planetary Worlds.

THE annual and diurnal motions of the earth are of great advantage to us; and we may presume that

the rest of the planets have the same advantages. Though the motion of Mercury and Saturn cannot be observed, it is very probable that, like the other planets, they turn on their own axis. The planets all move in their orbits round the sun; and the secondary planets move round their primary ones. Now as the seasons of the year, and day and night, are constantly produced by the motion of the earth, we may safely conclude that the same changes are produced on the other planets. Venus turns on her own axis in thirty-three hours and a half: the revolution of Mars is completed in twenty-four hours and a quarter: Jupiter finishes his in ten hours: and the moon in twenty-eight days. Now if their days be divided into twenty-four equal parts, like ours, the hours of Venus will be something shorter, and those of Mars something longer than those on our globe. But those of Jupiter will not be half so long as ours. An hour in the moon must be longer than that of our whole days. It is to be remarked too, that the position of the planets, like that of the earth, is inclined; whence it follows, that during their course round the sun, their poles are sometimes more, and sometimes less enlightened. Hence it is extremely probable that their revolutions and changes resemble those of the earth; and may we not conclude therefore, that they are filled with rational and brute inhabitants? The planets all resemble the earth, are warmed and enlightened by the same sun, and have their day and night, winter and summer. And what end would all this answer, if they be not inhabited? How immense, then, must be the dominions of the Lord? These are

parts of his ways, but how little a portion of him is known! When we reflect on the works of the adorable Jehovah, whose glory is displayed in all worlds, may it kindle in our minds sentiments of the most profound veneration and esteem.

MARCH 31.

The paternal care of Providence over Human Life, in all parts of the World.

IN consequence of the many discoveries that have been made, we are now acquainted with the greatest part of the world. But no place has at present been found, where nature does not produce some of the necessaries of life. There are countries where the sun burns up almost every thing; little else is seen but sandy deserts and mountains. The earth is there stripped of the verdure with which it is adorned in our climates. Some countries are seldom cheered with the genial warmth of the sun; but every thing is benumbed with an almost perpetual winter; and yet those regions are inhabited by men and animals, who do not fail of subsistence. As they cannot, in consequence of extreme heat or cold, be supplied with such delicacies as we are, providence has given them what is more suited to their climates and constitutions. They carefully seek what nature has in store for them, and thus procure for themselves all they require for their subsistence and convenience in life. Providence has so ordered it in Lapland, that an evil, in some respects very disagreeable, becomes a means of their

preservation. They are plagued with a great multitude of gnats, and can no way defend themselves from them, but by keeping up in their huts a continual thick smoke, and daubing their faces with pitch and tar. These insects, laying their eggs in the water, draw a great many aquatic birds, who almost entirely subsist upon them; and being taken by the Laponese, become themselves the chief food of those people. There are very few vegetables in the barren country of Greenland; and there the inhabitants generally prefer animal food. There are, however, a few plants in great request, viz. sorrel, angelica, and especially the spoon-herb cochlearia. But they chiefly subsist on the fish which they call angmarest. This they dry in the open air upon the rocks, and then it serves them instead of bread or vegetables: they preserve it for the winter in large leather bags. In Iceland, where, on account of the severe cold, there is no agriculture, the inhabitants substitute dried fish for bread. The Dalecarlians, who inhabit the north of Sweden, not having any wheat, make bread of the bark of birch and pine trees, and a certain root which grows in marshes. In Kamtschatka, the people feed on the stalk of the trunk of the bear's-foot plant, which they peel and eat raw. In Siberia, the roots of the mountain-lily are eaten. Adorable Father of all! such is the tender care of thy providence for our preservation! It is in thee that the inhabitants of all countries live, and move, and have their being. Thou sawest before the foundation of the world the dangers to which mortals would be exposed, and wisely and mercifully provided for their subsistence.

By thy unchangeable decree, such a relation, connection, and communication was formed between the inhabitants of the earth, that nations separated by vast seas, labour for their mutual support.

Adored for ever be the divine wisdom, that our bodies are so formed that we are not necessarily confined to one kind of food. Man does not live by bread alone, but by every word of God i. e. on whatever God has given the virtue of food and sustenance to.

APRIL 1.

On the abuse of Animals.

THE abuses to which dumb animals are subject, are almost innumerable. We may consider these abuses, however, chiefly in two points of light: viz. when too much, or too little value is set upon them: in either case, we act contrary to the divine intention. We sink them too low, on the one hand, when under pretence of being permitted the use of them by the Creator, we assume an unlimited power over them, and fancy we are right in treating them according to our caprice. Even supposing we had that right, which is by no means the case, should our power degenerate into cruelty and tyranny? Men in general are naturally inclined to compassion towards every thing that has life and feeling. Where this disposition is wanted, it is an awful proof of the depravity of human nature: such a person is but one step from a monster. We may see from history and from examples which we can recollect,

that this is too much the character of mankind. Those who take pleasure in bull-baiting, are generally distinguished for cruelty towards their fellow-creatures. A merciful man is merciful to his beast. It is granted, that we may have a right to destroy hurtful animals; but it does not follow from hence, that we are authorised to take from them without any pity that life which is so sweet to every creature; or that we should indulge a barbarous pleasure when necessity obliges us to destroy them, in making them suffer torments worse than death itself. God has given us animals for our use and pleasure, which are designed by their labour to spare ours. But surely we ought not to make them labour beyond their strength, to refuse them that sustenance which they merit by their labour, or to aggravate their sufferings by severe treatment. But men sometimes fall into the contrary extreme, by setting too high a value upon animals; and are often inspired with an extravagant and misplaced affection towards those social and domesticated. It is almost a shame to report, that there are men and women extravagant enough to love those animals to such a degree, as to sacrifice to them the duties which they owe to their fellow-creatures. The news of enkindling war, of bleeding armies, or of sacked cities, does not make the least impression on a lady who is become inconsolable for the loss of her lap-dog. I wave this subject, in order to conclude this reflection by introducing a very important remark:—Whoever has the care of children should scrupulously avoid all abuse of animals. This needs to be inforced the more, because

't is too much neglected. Perhaps no beast should be killed in the sight of children; much less should they be employed in doing it. They should be taught to treat animals as beings which have feeling and life, and towards whom we have duties to fulfil. Nor should children be permitted to form too strong an attachment to animals, which they are apt to do; but to view them as proofs of the Creator's wisdom, power, and goodness.

April 2.

On the motion of the Earth.

How delightful is the prospect of the rising sun! While the view of it ought, each morning, to renew the gratitude and admiration due to the adorable author of the universe; it may at the same time be observed, that the place in which this magnificent sight is beheld changes with the seasons. The slightest observation may convince us of this; and hence we may reasonably conclude, that some motion must be the cause of these changes: for whenever a body changes its relative situation, that change must be occasioned either by its own motion, or that of another body. As we see the sun sometimes near the south, and sometimes near the north, at is rising, we are ready to think that it is the sun which moves. But the observations of astronomers prove that it is the earth which moves while the sun is nearly stationary. Let us think for a moment on the immense space in which the heavenly bodies are

placed. Either it is empty, or it is filled with a substance infinitely subtle, which we call æther. Our globe, and all the planets which compose the solar system, float in that space. The sun, whose dimensions have been noticed already, is placed in the center, and all the planets revolve round it in their respective orbits. By the gravity which our globe has in common with other bodies, it tends towards that center. It moves in a circle round the sun, in the same way as we have seen a stone turned round in a sling; or to use a simile more analogous, like a cannon-ball, which describes a curved line. Certainly it falls again to the ground, when it has gone a certain distance; but this would not be the case perhaps, had it been sent off from the top of a high mountain. And could it be raised a still greater height, it would fly further in proportion; and could the height be sufficiently increased, it would fly as far as our antipodes, and return at last to the point from whence it set out. The laws of gravitation in our globe would produce all these effects; and it is in the same way that the earth describes its orbit round the sun. This orbit is not a perfect circle, but somewhat elliptical, on which account we are sometimes further from the sun than at other times. The revolution of the earth round the sun is completed in three hundred and sixty-five days five hours forty-eight minutes and forty-three seconds, which is the length of our year. The sun in spring is seen at equal distance from the poles, which occasions equal day and night. It is twenty-three degrees thirty minutes nearer the north in summer,

when the days are at the longest, and it returns again in autumn to an equal distance towards the south-pole ; so that in winter it moves as far towards the south, as it had done in summer towards the north ; then our days are at the shortest.

O Lord, how marvellous are thy works ! In proportion as we discover thy glory in nature, may we adore thy name. Thou art every where. All thy works praise thee, for thou hast done all things well.

APRIL 3.

On the immense riches of Nature.

IF we reflect on the prodigious number of human beings, who constantly receive their food, raiment, and every pleasure they enjoy, from their mother earth, we shall be convinced of the great liberality with which nature dispenses her gifts. And not only human beings, but an innumerable quantity of living creatures besides, inhabitants of the air, the waters, and the earth, are daily indebted to nature for their support. Those animals which are under our care, are still indebted to the earth for their subsistence : for the grass, which nature spontaneously produces, is their chief food. The whole race or fishes, except those which men feed for their amusement, subsists without any of their aid. The species of birds, which is perhaps the most despised and most numerous, is the sparrow. What they require for their support is incredible ; but nature takes care to feed them ; they are however but the

smallest part of her children. So great is the quantity of insects, that ages may pass before even their species and classes can be known. How many and how diversified the sorts of flies that play in the air! The blood taken from us by the gnat, is very accidental food for them; and we may suppose, that where there is one gnat that lives on it, there are millions that have never tasted human blood, or that of any other animal. On what can all these creatures subsist? Perhaps every handful of earth contains living insects; they are discovered in every drop of water: their multiplying and means of support are incomprehensible. While nature is thus prolific in children, she is also fruitful in means for their subsistence: or rather it is the God of nature who has poured into her bosom this inexhaustible source of riches. He provides each creature with its food and dwelling. For them he causes the grass and other herbs to grow, leaving each to select its proper food. And however mean many creatures may appear to us, he feeds and assists them all.

O almighty God, how manifest is thy greatness! Thou dost what the united efforts of all mankind would fail to accomplish. Thou hast given life, and breath, and being, to all creatures that live in the air, the waters, or the earth. Surely thou wilt do for thy believing people what thou dost for animals and insects! When we are filled with doubts and fears, let us consider the ravens whom the Lord feeds when they cry. Let them and all creatures beside, which man takes no care of, teach us the art of contentment. The great Author of nature knows all our wants. Let us cast our every care on him

APRIL.

"There is not any thing more beautiful and Splendid in Nature than the rising Sun"

April 1.

for he careth for us ; and may we come boldly to the throne of grace, in faith and sincerity, that we may obtain mercy, and find grace to help us in every time of need.

April 4.

On the rising Sun.

Perhaps you have sometimes been a witness of the magnificent phænomenon which is daily afforded us by the rising sun. Or have you been deprived of that grand sight by idleness, the love of sleep, or a culpable indifference ? Perhaps you are like those persons who never thought a sight of Aurora worth the sacrifice of some hour's sleep. Or you may be like many others, who contented with the light of the sun, do not trouble themselves to enquire into the cause of this astonishing effect. Or finally, you may have beheld this pleasing scene, like millions beside, with a stupid insensibility ; not feeeling any emotions of pleasure or gratitude. It is of little consequence in which of the classes you are found : it is time, however, to be roused from your insensibility, and learn what thoughts the rising sun should excite in your soul. Perhaps there is not any thing more beautiful and splendid in nature. When compared with this beauty, the richest dress that human heart can invent, the finest decorations, the most pompous equipage, the most grand ornaments in the palaces of kings, vanish and sink into nothing.

The eastern region of the sky is at first clothed

in the purple of Aurora, and announces the approach of the sun. By degrees the air takes the bloom of the rose, and then quickly shines in the lustre of gold. Then the sun's rays soon pierce through the mist, and light and heat are spread over the whole horizon; when the sun once again appears in all the splendor of majesty. It gradually rises higher and higher, and the earth puts on a different aspect; every creature rejoices, and seems reanimated. The birds with melodious songs of joy, salute the source of light; the animals begin to move, and seem animated with new strength and spirits.

Bless the Lord, O my soul! Let my songs reach those heavens where he dwells, by whose command the sun rises, and who so guides it in its diurnal and annual courses, that we draw from it the happy revolutions of day and night, and the seasons of the year. May my soul rise towards the Father of lights, and set forth his majesty. Let me celebrate him by an humble dependance upon him, and those actions which he will approve. Harmony and order are displayed through all nature: sun, moon, and stars praise the Lord. Shall I be the only creature that stands idle? Rather let my piety and zeal teach the infidel, how worthy that God whom he despises is to be adored: and let me act towards all men as the Father of mercies acts towards me. May I be to mankind what the sun is to the universe. As it rises on the evil and on the good, shines on the valleys as well as on the mountains, so may my life be useful to all around. May I increase in charity, and do good to all. In a word, may I so live and

act as to glorify God, and be a blessing to mankind.

April 5.

On the curious construction of the Ear.

It is true the eye excels the ear in point of beauty. Nevertheless it is formed with excellent art, and is no less a master-piece of the creative hand. Much wisdom is discovered in the situation of the ear. It is placed in the most convenient part, near the brain, which is the common seat of all the senses. Even the outward form of the ear is admirable: it much resembles a muscle, but has neither the softness of flesh, nor the hardness of bone. Were it only flesh, its upper part would fall down over the orifice and prevent the entrance of sounds: and on the contrary, had it been composed of hard bones, it would have been both inconvenient and painful to lie on either side. Therefore God has formed the outward part of the ear of a gristly substance, which possesses all the requisites proper to reflect sounds; for it seems to be the office of the external parts to collect and convey them to the bottom of the ear. The interior construction of the ear is still more admirable, in the shell of the ear there is an opening, called the auditory-pipe. In the entrance there grow little hairs, which serve as a bar to prevent insects, &c. from penetrating into it. For the same purpose, the ear is moistened by a conglutinous and bitter substance, called ear-wax. The drum of the ear is obliquely placed in the auditory-

pipe. This part of the ear bears a real resemblance to a drum ; for first, in the cavity of the auditory-pipe is a bony ring, and on it a thin dry membrane stretched : and secondly, there is under that skin a string tightly stretched, which answers the same purpose as the drum ; for by its vibrations it increases the motion of the drum of the ear, and sometimes relaxes the membrane. There are some very small bones in the hollow, of a particular kind, called auditory-bones, and distinguished by the following names : the hammer, the anvil, the orbicular, and the stirrup. They serve to assist the vibration, and to tighten the skin of the drum. Behind the cavity of the drum is another opening, which leads to the palate, and which also helps to produce the sensation of exterior sounds. Next to this is the snail, which rises in a spiral form ; and behind is the auditory-pipe itself, which joins the brain. The sense of hearing is itself wonderful. By a very small portion of air which we put in motion, without being conscious of it, we can instantly make our thoughts known to each other, in as perfect a manner as if we could actually see into each other's souls. But to comprehend the action of air, in the propagation of sounds, we must recollect that it is a fluid, and not a solid body. If a stone be thrown into running water, undulations will result from it ; which will extend more or less, according to the degree of force with which the stone is thrown. Let us imagine that a word produces in the air the same effect as was produced by the stone in the water. While the person speaking is uttering the word, the air with greater or less force, is expelled out of his

mouth; this air communicates to the external air which it meets an undulating motion: the air thus agitated, shakes the stretched membrane of the drum of the ear; this membrane thus shaken, causes the air which resides in the cavity of the drum to vibrate; by this means the hammer is struck, and that again strikes the other little bones; the stirrup communicates to the nerves the motion it has received, and they then vibrate like the strings of a fiddle. This motion acquires strength before it reaches the auditory nerves; a sensation is then received by the soul, which, by the mysterious law of the Creator, forms to itself representations of objects and truths.

In order that we may estimate more the worth of hearing, God permits some to be born deaf.—Rightly to improve this subject, let us attend to the exhortation of Christ:—He that hath ears to hear, let him hear.

APRIL 6.

On the Milky Way.

WE often see in the sky, at night, a pale and irregular light over our heads, which consists of a certain number of stars, by the mixture of whose rays this light is formed. We commonly call this luminous track the milky way. The immense distance of these stars render them invisible to the naked eye. The spaces between them, when they are seen through a glass, makes it probable that there are innumerable stars beyond them, which the telescope can-

not bring into view. Certainly there is a prodigious number discovered already; but could we make our observations on the opposite side of the globe, we should discover a great many more that never appeared in our hemisphere, and even then, how small a part should we know of those radient orbs contained in the immensity of space. The stars in the milky way appear to be nothing but shining specks, though they are much larger than the globe we inhabit. Could an inhabitant of our globe travel in the air, and could he attain the height of a hundred millions of leagues, still those bodies of fire would appear only as shining specks. Incredible as this may appear, it is an established fact; for about the 20th of December we are one hundred and eighty millions of miles nearer the northern part of the sky, than we shall be on the 20th of June; and, notwithstanding this, the magnitude of those stars always appear the same.

We may learn from the milky way, though it be so inconsiderable when compared with the whole expanse of the heavens, the greatness of the Supreme Being. A late ingenious astronomer, by the assistance of a telescope of extraordinary power, has formed this opinion of the milky way; "That even "our sun, and the whole solar system, forms but a "part of the radiant circle. Many small specks in "the heavens, never yet seen by mortal eye, con-"sists (he says) of millions of stars, which are pro-"bably entire systems in themselves." Reason must here stop and be confounded: what more can we do, but fall down and adore! Grant, O Lord! that I may raise my thoughts to thee, whenever I

behold the starry heavens. I confess with shame and regret, how little I have thought of thee at the sight of the heavens: how little I have admired thy greatness, or praised thy power. Graciously pardon this insensibility and ingratitude. Raise this soul of mine, incumbered with earthly ties and dying concerns, raise it to thyself. O God my Saviour! may a sense of my utter unworthiness humble me before thee, and in due time lift me up; that my redeemed soul may one day rise above the region of the stars!

April 7.

On the Seeds of Plants.

To an attentive observer of the works of God, the vegetable kingdom is a school where he learns something of the profound wisdom and almighty power of the Creator. Were we to live a century upon earth, and could we devote the whole time to the particular study of one plant, we should not fully explore the wonders contained in it. Let us employ our thoughts on the production of plants; on their interior construction, and the formation of their several parts; let us consider their simplicity and variety, from the blade of grass to the tallest oak; let us try to observe how they grow, how they propagate, how they are preserved, and how great is their utility to mankind and to animals; and each of these particulars will convince us of the infinite wisdom, power, and goodness of the adorable Creator. We shall every where observe, the most

astonishing, incomprehensible order, and the most wise and gracious design. If we knew nothing more of plants than is generally known, and observable by every eye, this would be enough fully to convince our minds of the wisdom of the Creator. Let us only observe the changes which a grain of wheat passes through. At a proper season, we sow it in the ground, and we can do no more; but when we thus leave it to itself, what are the operations of nature? No sooner is it supplied with sufficient moisture, but it swells and bursts the external coat, which till then had concealed the root, the stalks, and the leaves. The root strikes through, sinks deep into the earth, and prepares nourishment for the stem, which uses its efforts to rise above the surface of the ground. Thus it grows and expands its leaves, which are white at first, then yellow, and finally tinged with green. What consummate wisdom is discoverable even in this single grain of wheat! Observe how, by degrees, it grows up and becomes an ear of corn, which is so pleasing a sight to mankind.

The sight of corn fields ought to remind us of those fields where God deposits different seed. The bodies of men, when buried in the earth, are as seed sown, and which are designed to grow and ripen for the harvest of eternity. The resurrection of the bodies of the saints to eternal life, is not much more wonderful than the changes that take place in nature.

The time hastens when the seed will burst forth. My dust shall rise again, and I shall live eternally through him that died for me and rose again. The dust

must return to dust; but I shall not remain for ever in the grave. After the labours and sufferings of this life, my soul shall rest in the bosom of my God, which will be a happiness beyond the conception of all created minds.

April 8.

On the blueness of the Sky.

We might imagine, were we to judge simply by our senses, that the sky over our heads is a vast vault painted blue, and that the stars are so many well-polished nails fastened in it. Certainly these are childish ideas; yet many who are not children, and who think themselves superior to the vulgar, form the most absurd notions of the sky and its blue appearance by day. Our atmosphere, not being altogether transparent, seems to be the cause of it. Could we be raised very high above the surface of the earth, we should find the air much more subtile, till at length it would be pure æther, which we could not breathe in. The atmosphere is lighter on the tops of mountains, and the bright azure of the sky appears more pale. Could we rise as high as pure æther, this colour would be entirely lost. The sky then would appear as black as at midnight; for all those objects appear so that do not transmit any rays of light to us. Therefore, if the surrounding air was as transparent as æther, the sky would not appear blue to us. Perhaps, from these reflections, some may be led to form different views of the sky from what they had before. We may hence con-

clude, that in all the phænomena of nature, even in the colour of the sky, we may discover utility, order, and wisdom. As no colour could have ornamented the earth so well as green, so the fine azure blue of the sky is the best adapted to charm our eyes. The majestic simplicity of the vault of heaven far surpasses the palaces of kings, when decorated by the most skilful painters. The more we reflect upon it, the more charms we find. What then must it be to behold and enjoy the glories of heaven; where there is no need of the sun or the moon but the Lamb is the light thereof?

April 9.

On the utility and necessity of Air.

This lower world owes its life, beauty, and preservation to the element which we call air. The various changes which take place in the different beings here below, depend upon the air. Most animals would die in half a minute were they deprived of air, and the rest could not bear the want of it two days at the most. It is not only terrestrial animals, and those who inhabit the air, that cannot live without it; but it is also indispensable to the inhabitants of the waters, which need fresh air as much as other animals. If birds fly, they are supported by air; and in order to this, their lungs have openings through which the air passes into the whole cavity of their belly. This single circumstance shews the profundity of divine wisdom; for the body of the bird being filled and dilated by the air becomes lighter

and is better adapted for flying. Plants themselves, in order to vegetate, must have air; and hence it is that they are full of small vessels, which serve to take it in, and by which means the smallest particles are supplied with the necessary juices. Though many proofs more of the necessity of air might easily be adduced, we shall mention only one: there would be no twilight before the rising of the sun, if the air did not exist. It would suddenly rise above the horizon, and appear as bright as at noon-day. Nor would its appearance be altered in the smallest degree, till the moment it disappeared again, when we should be left in midnight darkness. Were there no air, the sun indeed would strike our eyes with a bright light; but it would have the appearance of a large fire in an open country during the night. It would certainly be day, in some sense, as long as the sun and surrounding objects are visible; but all the rays which fell on bodies, placed at a certain distance, would be reflected in a right line, and be lost in the extent of the heavens. Therefore, though the sun were placed over our heads, we should nevertheless experience a kind of night, were there no atmosphere. Let us recapitulate the advantages which our globe derives from the air. By it animal life is preserved. The fowls fly through it, and by its assistance the fishes swim. By it sounds are propagated; and it holds the earth in equilibrio with the heavenly bodies. Neither vapours, rains, nor winds, could be formed without it. It renders the earth fertile, promotes the vegetation of plants, and by its agitation disperses malignant vapours which exhale from different bodies. By it the light

and heat of the sun are increased, which would otherwise be insufficient. If the air did not set the organs of speech in play, if it did not transmit sounds, and act upon the organs of hearing, no person could be heard. What innumerable benefits then, in every respect, does the human race derive from air!

Were we to accustom ourselves to contemplate this grand spectacle of the creation with proper attention, we should naturally be led, without any other inducement, to exalt the works of our Creator. Perhaps the reason we too often neglect this duty, is because we have hitherto taken but a superficial view of his works; and while we enjoy his benefits, we do not deeply feel our own unworthiness. Let every reader then, for the sake of his own peace and happiness, endeavour, by the aid of divine grace, to become an attentive spectator of the works of God; for to those who properly consider them, they become a source of pure and permanent joy.

April 10.

On the different Soils of the Earth.

The soil is not in all places the same. The upper stratum is commonly black, friable, and rich earth; which, when mixed with the remains of plants, and animal substances, becomes the nourishing parent of millions of vegetables which enrich our globe. But even that stratum is not always the same in quality. In some places it is sandy and light, in

others it is clayey and heavy: it is sometimes moist and at other times dry; warm here, and cold there. Hence it is that some herbs and plants, which grow naturally in some countries, require the art of culture in others. Hence it is also, that vegetables of the same species differ among themselves in many respects, according to the nature of the soil on which they grow.

Here also we may clearly discern the wisdom of the Creator. If all soils were alike, or had they all the same quality, we should be deprived of many thousands of vegetables; as each species requires a soil analogous to its nature. Some require a dry, others a wet soil; some grow in the shade, others in the sun; some require warmth, others delight in cold; some grow on mountains, and many more in the valleys. Hence it is that each country has a certain number of plants peculiar to itself, and which do not come to equal perfection in others. If the alder be transplanted into a sandy soil, and the willow into one that is rich and dry, it will be found that those soils are not fit for them, and that it will be better to plant the former near marshes, and the latter by the sides of rivers. Thus God has provided for every class of vegetables, by assigning them that soil most agreeable to their internal constitution. It is true that art may sometimes succeed in forcing nature to produce according to our wishes; but it seldom pays the expence, and, after all, nature is found to have much the advantage over all the researches and operations of art.

The same variety that is observable in the soil of our globe, may also be seen in the characters of

mankind. Some are hardened to that degree, that they cannot profit by instruction. No motive can influence, no truth, however self-evident, can awaken them from their stupidity. This character resembles stony ground, which neither climate nor culture can render fertile. Another character, almost as worthless, is that where levity predominates. People of this class may, it is true, receive the salutary impressions of religion; but if the least obstacles come in the way, they are discouraged, and their zeal vanishes as quickly as their good resolutions. Such are those frivolous, cowardly, and timid people, in whose minds truth can take no root, because there is no depth. They are like those light and dry soils which bring nothing to maturity; where all is dried up by the scorching heat of the sun, because the soil does not supply the plant with the nourishing juices it requires. But how happy are those in whom, as in good soil, the seed of the word is sown, springs up, ripens, and produces an abundant harvest of good fruit!

The success of a preached gospel, depends less or more on these different dispositions in men. It is in vain to sow the best seed, if the soil that receives it does not possess suitable qualities; all the toil is useless, for the purity and goodness of the seed cannot supply the natural defects of the soil.

Let me ask myself, to which of those classes do I belong? Perhaps my heart is not so hard as to resist all impressions; but is it not like those light soils which produce here and there a stalk of corn, but brings nothing to perfection? Alas! how soon have good thoughts and holy resolutions fled from

me. I see plainly that this heart must be renewed by divine grace, and a principle of faith implanted in my soul before I shall have my fruit unto holiness, and in the end everlasting life. But to effect this change is beyond the compass of my power; it is the work of the divine Spirit. O my God! come to my help; make me as the fruitful soil, that I may be rich in good works, and bring forth fruit an hundred-fold!

APRIL 11.

Rest necessary at Night.

DOUBTLESS labour is necessary for man; and every one, according to his taste and condition, should apply himself to it; as a great part of the happiness and convenience of life depend upon it. But it must be granted, that the strength of human nature would soon be exhausted, and men could neither use the members of their bodies, nor the faculties of their minds, if God did not continually supply them with such strength and activity as are necessary to fulfil the duties of their vocation. As we daily lose some of our juices, too great an exertion of our strength would soon bring us into a mortal decay, if our strength and animal spirits were not incessantly renewed. In order to be able to labour, it is necessary that a matter inconceivably thin and active should be separated from the blood, which is termed the nervous fluid. By this fluid the springs of the brain and muscles are put into, and kept in constant play so as to assist the action and

motion of our bodies. But if there were not a constant supply, this matter would soon be exhausted, and man would fall into a state of languor. Nothing would digest, or pass regularly through the body, if he where always in motion. The operation therefore of the different members must sometimes be interrupted, in order that the heat and animal spirits which were dispersed through the external parts, may be employed to assist the functions of the stomach during the repose of the other parts of the body. Sleep renders us this important service. At the close of each day, our strength, which has been exercising through the day, begins to diminish; the vital spirits sink, the senses grow dull, and we are invited to sleep, and are not able to resist. We feel ourselves refreshed as soon as we give way to it, The meditations of the brain, and the labours of the body cease at once, and the fatigued limbs acquire new strength. This reparation is as needful for the body as for the mind. By it our limbs become more pliant and active, and all the parts of the body are preserved in a proper state. Our intellectual faculties are re-animated, serenity is spread over our souls. How culpable then are those who for trifling reasons, for a vile interest, or to gratify their carnal desires, deprive themselves of proper time for sleep! They disturb the well-established order of nature, and wantonly enervate their bodily strength, and bring themselves to an untimely death. Why should we be mad enough thus to deprive ourselves of a blessing equally granted to all? Why should we shorten our days, when the wise and good providence of God has ordained sleep as a mean to

prolong life; Why should we not take our natural rest? Alas! nights may come, in which we may pass restless hours in a bed of anguish, and reckon the tedious and painful moments: and perhaps too, we shall never know the worth of sleep till we wish for it in vain.

April 12.

On the magnitude of our Globe.

It is not so easy as we imagine to determine exactly the size of the earth. Certainly there is but one longitude, but there are two latitudes, the north and the south. These both begin at the equator; the one extends northward, and the other southward, as far as the arctic and antarctic poles. But no man as yet has been able to reach either of these; but all who have attempted it have had their passage obstructed by vast islands, mountains, and fields of ice. Thanks however to the geometricians, by whose assistance we can nearly ascertain the size of our globe. The surface of the earth, according to exact calculations, is 199,512,595 square miles. By a measurement of the best maps, the seas and unknown parts of the earth, 160,522,026 square miles. Thus it appears that not more than one-third of the globe is inhabited.

It has been calculated that there might be three thousand millions of men upon the earth at one time; but in reality there are not more than one

thousand eight hundred millions: of which there are—

In Asia, - - - - - - -	650,000,000
In Africa, - - - - - -	150,000,000
In Europe, - - - - - -	130,000,000
In America, - - - - -	150,000,000

If wesuppose then, that the earth is inhabited by one thousand millions of men, or thereabouts, and that thirty-three years make a generation, it will follow, that in that space of time a thousand millions of men die: therefore the number of men who die on earth amounts

Each year to - - - -	30,000,000
Each day to - - - - -	86,400
Each hour to - - - - -	3,600
Each minute to - - - -	60
Each second to - - - -	1

We must necessarily be struck with this calculation. If the mortality be so great every year, day, and hour, is it not very possible that I myself may soon be one that shall increase the bills of mortality! This is a matter I ought seriously to consider. At this very moment one of my fellow creatures is launched into a boundless eternity! and before an hour is elapsed, more than three thousand souls will follow! Let this be a motive to lead me to think often and seriously upon death.

However astonishing the size of the earth, it dwindles almost into nothing when compared with the other worlds which roll in the expanse of heaven. In comparison of the universe, the earth

is not equal to a grain of sand when compared to the highest mountain.

O thou Creator of heaven and earth! how inexpressible and infinite does thy greatness appear! The world and all its inhabitants are before thee as a drop in the bucket, or as the smallest atom which sports in the sun-beams. What then am I among those thousands of millions of the inhabitants of the earth! What am I before thee, thou incomprehensible, infinite, and eternal God!

April 13.

The generation of Birds.

A REVOLUTION in nature takes place at this season of the year, which is certainly worthy of our notice. About this time, birds lay their eggs, and hatch their young. The following reflections may convince us, that this is an annual miracle which cannot be too much admired.

In every impregnated egg, which has not been set on, a small speck is seen on the yolk (in size about as large as a freckle) usually called the cicatrice. In the centre of this there is a white circle, similar to a small partition, extending a little upwards, where it appears to unite with certain little bladders. In the middle of this circle, there is a sort of fluid mater, in which the embryo of the chick is seen to swim. It is composed of two lines, which sometimes appear separated from each other at the extremities, and between which a fluid substance is seen of a lead colour. The extremity of the embryo

is contained in a small bag, encompassed with a pretty large ligament, and in this the navel afterwards appears. This ligament is composed partly of a solid yellowish matter, and partly of a brown fluid, which is likewise surrounded with a circle. Nothing further can be observed in the impregnated egg, before it is sat upon. After it has been under the hen about twelve hours, there appears in the ligaments of the embryo, which is in the centre of the little spot, a moisture of the form of a little head, on which small vesicles are seen, which afterwards become the back-bones. In about thirty hours, the place of the navel appears covered with a multitude of little vessels or bladders: then also you may distinguish the eyes. The two white threads, which in uniting have still left some space between them, inclose five little bags, which contain the matter for the brain and the spinal marrow. Then the heart becomes visible; but whether the heart or blood be formed first, none has yet been able to ascertain. However that may be, it is certain that the embryo of the chick existed before in the egg, and that after it has been some time sat on, the back-bones, the brain, the spinal-marrow, the wings, and part of the flesh, may be distinguished, before the heart, the blood, and the vessels can be seen. At the end of thirty-six hours, the navel is covered with a number of vessels, separated from each other by unequal spaces. In all likelihood they existed before in the cicatrice; and are now rendered visible by the fluid which swells them. The essential parts of the chick being thus formed, it continues to grow larger and larger, till in about

twenty, or twenty-one days, it is able to break the shell in which it was inclosed.

We owe these discoveries to certain naturalists, who, by the help of the microscope, have followed the progress of the formation and developement of the chick, almost hour by hour. But notwithstanding all past discoveries, there are still many mysteries which probably will for ever elude our researches. How comes the embryo into the egg? and how is it, that by means of heat (for nothing else is communicated by the hen) it acquires a new life and being? How is it that the essential parts of the chick are put in motion? and what is that vivifying spirit which penetrates through the shell into the heart of the chick, and produces pulsations? Who gave the birds an instinct to multiply in a way which is common to them all? How know they that their young is inclosed in the egg? Who disposes them to sit willingly on the nest till their young are hatched? These are questions which none can answer in a satisfactory manner.

We know enough, however, concerning the generation of birds, to shew us the wisdom of the Creator: for these things cannot be attributed to blind chance, nor to art assisting nature. He who does not see the hand of God in the generation of birds, will see it in nothing; for here the most profound wisdom is manifest.

O men! spectators of the wondrous works of God, adore with me the all-wise Being; and be not too proud to seek in apparently small objects the impress of his ineffable goodness, power, and wisdom.

April 14.

Prognostics of the Weather.

The various alterations of the air do not always depend on regular and necessary causes. There are, however, certain signs in nature from which we may often guess pretty nearly what sort of weather is about to take place. The position of the globe with respect to the sun, in the four seasons of the year; the changes of the moon, which may be known to a moment; the influence which these bodies, and all the planets in our system have on the cold, the heat, the motion, and the stillness of the air, are so many standing laws on which prognostics concerning the weather may be founded. The consequences drawn from them ought not to be despised, because they are founded on experience: and by the rules of analogy, the future is judged of by the past. It is true, a thousand accidental circumstances may produce alterations in the weather, which we had no reason to expect; but it must be remembered, that these accidental circumstances are seldom of long duration; and if they produce any change in the ordinary course of the weather, it is only for a short time, and in some particular places. Our annual observations may convince us that the change of the weather is so regular, that it may generally be foreseen. Seldom are we mistaken in supposing tha the north and east winds bring the cold, and the south and west winds heat and rain. With the same probability we may conjecture, that there will be

wind or rain when the morning sky is red; and that a red sky in the evening (when it is not of a copper colour) is a sign of fair weather the following day. The weather in spring shews us what we may expect in summer. When there are many fogs in spring, it is very likely the summer will be rainy. A hot summer, and many insects, follow floods in spring. There is nothing to fear from night frosts, when there have been storms in spring.

But we might rest perfectly easy, if it were impossible to foretel the weather. All the variations of weather are according to constant rules laid down by a wise providence; and we may be certain that the weather, however bad it may appear, will be best for the earth, and promote its fertility. Let us confide in God, whose purposes are always wise and good; without whose will there could be neither heat nor cold, rain nor drought, tempests nor calms: and who can render those phænomena, which appear most injurious, good for the earth and its inhabitants. Wisdom and beneficence shine in all his works; let every thing that hath breath praise the Lord; praise the Lord, O my soul!

APRIL 15.

The situation of the Sun.

THE Creator has assigned a situation for the sun which perfectly agrees to the nature of that body, and to the use for which it is intended. He has given it a certain bulk, and has fixed it in a space proportioned to the course it is to perform. God

has placed at a proper distance those planets on which the sun is to act; and this position which has been assigned to him so many thousands of years, he has kept without ever departing from it; because the smallest deviation would occasion the greatest disorders in the universe. Such a miracle could never be wrought but by unlimited power. None but God could create this immense globe, fix it in a proper place, mark its limits, determine all its motions, subject it to fixed rules, and constantly support it in the position and order prescribed from the beginning. What wisdom and goodness beam forth in this arrangement, both in respect to the whole universe, and to our earth in particular, with all its creatures!

The burning rays which proceed from a globe of fire, a million of times larger than our earth, must have an inconceivable activity, if in falling they were to remain close to one another; but as they separate more and more as they remove to a distance from their common centre, their power is diminished in proportion as they diverge. If our earth had been placed in a point where these rays were too numerous, or too near, the intense heat would have been insupportable; and had it been thrown to the extremity of the solar system, it could have received only a faint light, and too little warmth to bring its productions to maturity. The sun is therefore fixed in the very spot where it ought to be. Now it can communicate to our world a sufficiency of light and heat, and penetrate and vivify the earth with his benign rays. It can rarify the atmosphere, and produce all those effects, with-

out which we could have neither dew nor rain, snow, hail, fogs, clear or serene days. In its present situation, it causes the regular changes of day and night, as well as the different seasons of the year; and diversifies in each of them his influence or effects. God has not only allotted the sun, but all the planets and fixed stars, places suited to their nature, and agreeable to the ends for which they were created. He has also allotted me, who am nothing, less than nothing and vanity, a place which in all respects suits me best. O that I could but fulfil the duties of my station with as much exactness and fidelity as the sun acquits himself of his important offices, according to the invariable laws which were prescribed to him at the first moment of his creation! May I be useful to the world, by communicating knowledge to the ignorant, support to the weak, bread to the hungry, and clothing to the naked; and aim at God's glory in all, so shall I answer the end of my creation.

April 16.

On the permanency of corporeal Beings.

Nothing perishes in nature. Even from the beginning of the world to the present moment, not one grain of sand, not one atom of dust has been annihilated. The first forests which God created, were adorned with an innumerable multitude of leaves; but still the parts which composed them remained; they were changed into dust, clay, or earth, but not annihilated. The matter out of

which the first leaves and herbage were formed, still subsists even to this day, without having lost any of its parts. The plants which now flourish, shall exist, as to their component parts, as long as the world endures. It is true, the wood which we burn ceases to be wood, but its parts do not cease to exist; they are dispersed into ashes, soot, and smoke, but not annihilated. The empire of nature is liable to continual changes; all dissolves, all is regenerated, but nothing perishes. We must not judge of these things from appearances. When revolutions and disorders take place in nature, we are ready to think that many beings are totally destroyed, but here we err—they are only differently modified, and become materials which enter into the composition of other beings. That water which rises in vapours, does not perish; it decreases in one place to increase in another. What uninformed persons consider as total destruction, is in fact nothing but a change of parts; and the world, considered in the whole, is the same now as it was the first day of creation: notwithstanding many of its parts have undergone very considerable alterations.

Here we may pause, and think of the change which we shall undergo in the grave. Though our bodies will be entirely corrupted, they shall not be annihilated; but the integral parts which compose them shall remain for ever. The belief of this truth should guard us against the fear of the grave, and confirm our hope of a resurrection to eternal life for all true believers.

Why then should my heart be troubled? Why shud

der at the thoughts of the grave? That which descends to the grave, and is shut up there, is not I, but my earthly house. I myself cannot be destroyed. All my members are counted, and I shall be preserved: what I have been I shall be for ever, and shall endure world without end. Hence I may also conclude that my soul is immortal. As none of the earthly parts will be annihilated, am I to suppose that my soul should be the only created thing that is to be destroyed?—No. The whole corporeal world shall sooner perish, than the soul redeemed by Jesus Christ.

APRIL 17.

On the utility of Rain.

RAIN may properly be termed a present from heaven. By this means the most numerous and indispensible blessings are poured upon us by our heavenly Father. How fatal would be the consequences of a continual drought! How precious are the benefits which a beneficent and refreshing rain procures us? Who can fully estimate the blessings which accrue to us from rain? But though we cannot give a minute account of them, we may at least reflect on some of the most considerable. The heat of the sun uninterruptedly acts on the different earthly bodies; and continually detaches subtle particles from them, which fill the atmosphere in the form of vapours. These dangerous exhalations we should breathe with the air, were they not

carried off by the rain; which, bringing them down to the earth, thus purifies and refreshes the air. Rain also tends to moderate the scorching heat of the atmosphere: the reason is very evident, for the nearer the air is to the earth, the hotter it becomes by the refraction of the rays; and the further it is from us, the colder it is. When the rain falls from a high region, it brings a reviving coolness to those below; the pleasing effects of which we feel as soon as it has rained.

To the rain also we must partly impute the origin of fountains, wells, lakes, brooks, and rivers. Every one knows in what abundance we are supplied with these different waters in wet and rainy seasons; whereas they evaporate during a long drought.

But if we observe how the earth and vegetables languish for want of these fruitful showers, we shall be sensible of the necessity and utility of rain. In many respects rain is the food of vegetables. It moistens and softens the earth; which would otherwise be parched, and in a manner petrified by the heat of the sun. It carries to, and circulates in the delicate veins and vessels of plants and trees, those nutritious juices which support their life, and increase their size. By washing the mountains, it brings down soft rich earth, which it deposits in the valleys where it falls; by which means they are rendered fruitful. O my God! all thy works are perfect! the earth is full of thy goodness. This is the conclusion I would draw from these reflections.—If the subject impresses my mind, let me pursue it a little farther, that the impressions may be deepened. How beautiful is a serene and clear sky!—enough,

one would think, to fill every heart with admiration and joy. But the interception of clouds veils all this beauty. Then ought we to indulge such reflections as these. What are all the beauties of nature when compared to the beauties of that great Being, the contemplation of whom can alone constitute the felicity of an immortal spirit?

It is in infinite wisdom that God sometimes deprives us of those things which please us the most. He designs that we should seek our happiness in himself, and consider him as our sovereign good. Besides, those very privations which we sometimes experience, are more than compensated by many outward advantages. The clouds, which hide from us the beauties of the sky, are the sources of those beneficent showers which fertilize the earth. Let us always recollect, that though adversities may render our days gloomy, yet those afflictions will work together for our good, if we love God, and are called according to his purpose.

God can punish us by giving us too much rain, as well as by withholding it. In like manner, too great an abundance of this world's good may be the cause of our destruction. Let us adore the Eternal for withholding those gifts which may ultimately prove our bane. Finally, let us be content with all the dispensations of that wise providence which governs the world. The All-wise best knows how to distribute his benefits. He commands the clouds, and they fly to execute his will. Let us consider our own nothingness, and never blame the ways of providence.

April 18.

On Respiration.

Breathing is the principal and most necessary of all the functions of animal life. Without it nothing could be expelled from the body in any way whatever. Speech itself, and the several inflections of the voice, require breathing. It helps the smell; it serves to mix the chyle, the lymph, and the blood exactly together; and probably supports and renews the animal spirits, by mixing the air with the blood. In fact, we could not exist an instant, if absolutely prevented from respiration. But whence proceeds this fountain of life? How is it that we can respire? Properly speaking, our lungs are the organs by which we draw in and let out the breath. This viscus resembles a large purse, at the top of which is fastened a pipe, by which the air penetrates into an infinity of vessels, trunks, and branches, which form the internal structure of the lungs. The air, being drawn into the lungs, swells the belly, and causes the sides to expand, and the breast-bone to come forward. On the contrary when we expel the air, the abdomen is depressed, the ribs lower, and the breast-bone withdraws towards the back. That all this may be done in the most convenient manner, the Creator has, with the utmost wisdom, adjusted the internal parts of the body. Upwards of sixty muscles are constantly employed to procure respiration, by alternately dilating and contracting the breast. How admirable is the construction of the wind-pipe! At the top it is covered with a valve, which closes it at

the moment of deglutition; by which means the aliments are prevented from passing that way, and the breathing from being interrupted. The lower part of this organ, the branches of the wind-pipe, the vesicles of the lungs, the distribution of the veins, arteries, &c. are not less wonderful.

How thankful should we be, that God, who gave us breath, still permits us to breathe! What gratitude should we feel, when we consider that we respire twelve hundred times in an hour, and that each gasp depends on God! This faculty of breathing might be stopped and interrupted by a thousand accidents. While we eat or drink, how many hurtful things might enter into the wind-pipe, and cause our instant death! O Lord! we are every moment dependent on thy care! But how ungrateful have we been for these continual marks of thy goodness! Breathing is a blessing we enjoy every instant, without perhaps remembering that we are indebted to God for it. Lord! make us more sensible of thy goodness, and may our life be continually devoted to thy praise! Give us the desire and the power to celebrate thy infinite goodness!

Feb. 19.

Proofs of divine goodness in the works of Creation.

All the phænomena which we behold in the earth, or in the air, evidently tend to the good of the animal world. All that we see around us, over our heads, and under our feet, serve for our support and enjoyment. Nothing can be more needful for

the support of life than food; therefore the ground is covered with it. Herbs, pulse, and fruits, for the support of man and beast, are dispersed over the whole surface of the earth; so that it is difficult to find a place where animals cannot subsist. The blessings of providence are heaped upon men. Water and the most common roots might suffice merely to support life. But with what liberality has God furnished us with the greatest variety! He is not like the penurious miser, who gives nothing to his dependants but what is necessary to keep them from starving. As a generous host, he spares nothing to treat his guests, and profusely to give whatever can afford them pleasure. Such is the munificence of God towards every being. Living creatures inhabit the plant, the shrub, the water.

On a tree, for instance, there are (besides fruit) leaves, bark, and wood. Now all those parts are food for living creatures: on the leaf feeds the caterpillars; certain worms live on the bark; others live in the woody parts. Thus all things in nature are useful to animals. How great must the mercy of that God be, who provides for the necessities of all his creatures?

What can be more pleasing than the light? Truly the light is sweet, and a pleasant thing it is for the eye to behold the sun. His rays are diffused through the whole extent of heaven; and while the day lasts, the eye is surrounded with those rays. Whilst it partakes of this universal benefit, it enjoys a varied and transporting view of the creation. The riches and glory of the divine works are discovered to us by the light: without it nature would become

a desert, and all its beauties would lie for ever hid.

How bountifully has God provided for the gratification of our senses! For instance, he has chosen the mildest and properest colours to please and refresh the sight. Blue and green are found by experience to be the least hurtful to the eye, and what we can longest bear. For this reason God has clothed the sky with blue, and the earth with green; two colours which agree with our eyes. They are vivid and pleasant enough to make agreeable impressions upon our eyes, and not too bright to injure them. They have also a variety of shades, sufficient to distinguish the objects, and prevent too great an uniformity. The earth also produces the most beautiful flowers, which not only please the eye by thousands of different tints, but also perfume the air and regale our senses with the most delicious odours. Nor is the ear idle; the songs of birds delight it, while the heavens are filled with their melodious concerts.

I exalt thee, O my God! with a heart full of joy and gratitude. I celebrate thy goodness. How gracious and tender thy fatherly protection! Thou seest all thy creatures, and despisest none of them. They are all objects of thy providence, and thou watchest over them all. I will rejoice in thy goodness, and never cease to bless thy name.

April 20.

On the pleasing effects of the heat of the Sun.

When the spring approaches, there are revolutions before our eyes, which must fill every attentive observer with astonishment. Nature, by degrees, assumes the life which she appears to have lost during the winter. The earth is dressed in verdure, and the trees are covered with blossoms. New generations of animals and insects burst forth on all parts; which rejoice in their existence, and which are endued with a thousand different instincts. All nature is animated; all things revive. The return of warmth produces this new life, and awakens plants and animals, and puts their renewed strength in motion. This admirable revolution we owe to the sun, which is the source of life, sensation, and joy. Seed feel its effects, and open in the bosom of the earth. From thence it is that the plants spring up and grow. Animals are revived and strengthened at its approach. In short, all nature feels the benign influence of that majestic globe. What would be the consequence if we were deprived of the light and heat of the sun? The earth would be reduced to a dismal uninhabited desert! A stupor would seize a great part of the creatures, and they would languish out a miserable existence. Could we not enjoy the exhilarating rays of the rising sun, or the light of a serene day, what a source of joy and gladness should we be deprived of! Nothing could compensate the loss. The mildest night, the most

temperate artificial heat, could not supply the place of that vivifying influence which the light of the sun communicates to all beings; and which has a salutary effect, very different from that of earthly fire: this is experienced by man and animals. An infirm person shut up in his warm room, with every assistance, will not gain so much strength in many weeks as he would in a few days, under the mild influence of the sun in spring weather. Plants forced in hot-beds never gain such a degree of strength and consistence as those do which grow under the strengthening rays of the sun. Every thing in this case combines for the perfection of the plant; whereas in those produced by artificial heat, we perceive only the weak and languishing efforts of nature's substitute, without her energy.

But could the sun exist, could it communicate light and heat to us, if the Creator of all things had not formed it, and given it power to diffuse its vivifying rays over the earth? All the benefits we derive from solar influence, proceed from the Lord alone. It is he who created the sun, regulated his rotation, and continues to maintain his light and splendor. To Him we are indebted for its diurnal appearance, and for all the blessings we receive from it. There could be neither sun, light, heat, or spring, without him. Let us then adore the Creator of the sun: he is the Father of lights. The stupid pagans worshipped the sun: they stopped at the effect, without acknowledging the cause. But we are sure there could be no sun if God did not exist; and that it could give neither light nor heat if God had not so ordained. All blessings flow from Him.

The sun is but the instrument of his goodness; the minister of his will; the herald of his glory.

April 21.

The relation which all Creatures bear to each other.

The astonishing number of creatures on the earth, is a subject which well deserves our admiration. But what is more wonderful, is the proportion between all these, and the wise relations which connect this vast number of different beings, so that they form but one regular and perfect whole. Though the extent of animated nature be incomprehensible, yet every creature finds sufficient food. No species, however small their number; no individuals, how ever persecuted they may be, become extinct. It is true indeed that many serve as food for others; but the number of rapacious animals is not great. They are mostly solitary, and do not multiply much. Those which are most numerous, do not require much food, and to procure it costs them much labour and art. Many are prevented from increasing by their enemies; or else the weak and timid animals supply in number what they want in strength, and escape their adversaries by all sorts of cunning and address. It is also to be observed, that for the preservation and increase of species, there is an exact equilibrium between the two sexes, so that every animal finds its mate with which it may associate. The animal kingdom is preserved by the mineral, and both tend to the benefit of mankind. Corn,

and the most useful plants, multiply easiest, and are the least liable to spoil. The most useful animals abound every where. Each climate produces what is suited to the particular wants of mankind. The hottest countries abound in cooling fruits. In countries liable to great drought, there are certain trees and plants, which are in a manner springs of water; and which yield enough to quench the thirst of men and animals. Peat and turf abound where wood is wanting. These countries that are deprived of rain, are compensated by fruitful inundations, like that of the Nile, in Egypt. There is also a most exact proportion between the sexes in mankind: they are nearly equal. The number of males to that of females, is about twenty-six to twenty-five. In civil society, goods and talents are distributed in an admirable manner; that as each individual may be happy according to his circumstances, so nothing that is necessary is wanting to society in general. Were not the inclinations and propensities of men so varied, if their talents and tempers did not make them embrace different kinds of life; and were there not such a diversity in their genius, mode of thinking, in beauty, riches, and other outward circumstances, human society would soon become a melancholy desert. All classes of men are dependant on each other. Every country has its peculiar advantages; and were these common to all, there would be neither connections nor commerce among them. In short, whithersoever we turn, we shall find the most admirable harmony, and the most exact proportions. Notwithstanding the infinite variety of creatures, and the continual interruption of

many of the laws of nature, it is evident, that in this immense universe perfection runs through the whole; all is in the most exact and regular order. The most delightful harmony shines every where, and embellishes all. All things combine to the same end. All is connected by the most astonishing art.

O thou infinitely wise Being! may we exalt and adore thee with the most profound admiration! Teach us, above all things, to adore that ineffable goodness, which has ordained all things in a manner most conducive to the benefit of thy creatures.

April 22.

On the constituent parts of Winter.

We imagine when we drink water, we enjoy a pure and simple element; but we are mistaken: for naturalists assure us, that each drop of water is a little world, where the four elements and the three kingdoms of nature unite.

Almost all water is full of heterogeneous matter, as is evident when it is filtered and distilled. Water contains, besides its elementary parts, divers earthy particles: such, for instance, as belong to the mineral kingdom; chalky earth, nitre, and other kinds of salt. This we cannot doubt, if we consider the abundance of earthy matter which water must meet with, both in the air and on the ground, which it either dissolves or carries along with it. Water likewise contains inflammable, or sulphurous matter; which becomes manifest when it corrupts. It

would become a solid and compact body without these fiery particles; for as soon as all its heat is taken from it, it becomes heavy, and acquires the hardness of ice.

Finally, we shall acknowledge also, that water is impregnated with air, if we attend to what happens when it boils. Thus it may be said, that all the elements meet in a drop of water.

But are there plants and animals found in water? The principles of vegetation are doubtless found in it, as all the plants draw their nourishing juices from it, and can neither grow nor flourish without it. The animal kingdom is certainly distinguishable in water. Not to mention fish, and other aquatic animals with which it is peopled, every drop of water has its inhabitants, which are easily discovered by the microscope. We know likewise how fast insects breed in stagnant waters; whose eggs are doubtless concealed in the water, although some external circumstances may prevent them from coming forth.

All this may lead us to reflect on the beneficent wisdom of God. Water does not contain so many particles by chance. Certainly it would be the purest of all drinks, were it an absolutely simple body; but then its medical virtue would be reduced to nothing. Water is not very nourishing of itself; but being very subtile, it dissolves the nourishing parts of aliments, becomes a vehicle for them, and carries them along into the minutest vessels, and is therefore the most wholesome drink indispensable to men and animals, and its salutary influence has been felt where all other liquids were found hurtful to the health.

What grateful praises should rise to God for every drop of water we drink! How rich are his bounties! He has communicated a wholesome virtue to the most ordinary and indispensable means of subsistence; and though we had nothing for our support but bread and water, let us learn to be contented with, and thankful for them.

April 23.

Of the propagation of Plants.

Vegetables generally come from seeds, and in most plants it is the blossoms which produce and fertilize the seed. Flowers, in general, are folded up in the bud, where they are formed in secret, and are defended by their coats and outside leaves. When in spring there is a large flow of sap, the blossoms grow larger, the buds open, the coat falls off, and the flower becomes visible. At the outside some very small leaves are seen of divers colours which serve to protect the organs of fructification. But these organs are found in the middle of the flower: in it there is a thread or little pillar, called the pistil, which rises pretty high, especially in tulips and some other flowers. The stamina, surmounted on the top which contain the prolific dust, of different colours, surround this pistil. These stamina are the male organs, destined to impregnate the germs; and the pistil is the female part of generation, and in some sort the womb to receive the fertilizing dust.

Vegetables may also be propagated by grafts

From a tender branch of a tree, when in sap, they take a bud, or commencement of a branch and part of the bark, and insert it between the bark and the wood of another tree; after which the whole is gently tied up with a soft cord. From this the branch proceeds, which is of the same nature as the tree from whence it was taken, though the tree in which it was inserted be quite of a different sort.

Trees may also be perpetuated by slips. For instance, a slip is taken from a willow, and after it is divested of the small branches, thrust into the ground. Roots soon proceed from this slip in those places where branches had begun to appear, and it becomes a tree.

Finally, vegetables are propagated by roots; but these, unless they have eyes, will never grow. Some plants shoot out long filaments in all directions, which have knots or eyes: these knots extend their fibres in the ground, and become so many new feet, which may be seperated from each other, and will notwithstanding become so many new plants. A bulbous root is a species of eye in which the plant is inclosed, between whose leaves there are small eyes, so that in fact the plant may be propagated by the leaves, when these little bulbs are attached to them.

How many causes must operate in order to produce, preserve, and progagate vegetables. Allowing that the germs pre-existed, what astonishing art is necessary to unfold them, to give them their proper growth, and to preserve and propagate each species! How prolific must the earth be whose

bosom can contain and nourish so many millions of plants!

O my adorable Creator! in all this I acknowledge thy wisdom and goodness! None but thyself could communicate to the elements that virtue necessary to form and perpetuate vegetables. Thou alone hast given to the sun that size and heat necessary to act upon our earth, so as to produce such blessed effects. By thy divine power, and for thy glory, thou hast created all things. Each spring thou renewest the face of nature, and thou crownest the year with thy goodness. Author of plants and men! let heaven and earth proclaim the glory of thy great name, now and through the unnumbered ages of eternity! Amen.

April 24.

The variety in the Features of the Face.

It is an evident mark of divine wisdom, that although the bodies of men are so conformed to each other in their essential parts; yet the difference in their external appearance is so great, that they may be easily and infallibly distinguished. Among many millions of men, there are not two exactly alike. Each has something peculiar, which distinguishes him from all others, either in his voice, his face, or his speech. This variety in faces is the more wonderful, because the parts which compose the human face are few in number; and are disposed in all persons according to the same plan. Had all things then been produced by blind chance, the faces of

men must as nearly resemble each other as eggs laid by the same hen, or balls cast in the same mould, or drops of water in the same bucket. But since this is not the case, we must admire the infinite wisdom of God, who in diversifying the features of the face in so wonderful a manner, has evidently had the happiness of mankind in view. For if they perfectly resembled each other, it would occasion an infinity of inconveniences and deceptions in society. Men's lives and property would always be in danger. Cut-throats and robbers would run no risk of being discovered, could they not be known again by the features of their faces, or by the sound of their voices. The foulest of crimes would go unpunished, because the guilty could scarcely ever be discerned. Every moment would expose us to the malice of wicked and envious men. What uncertainty would there be in all judicatory proceedings; in all sales, transfers, bargains, and the like! What confusion in commerce! what frauds and bribery in regard to witnesses! In short, human society would be deprived of the greatest part of its charms, and diminish the pleasure which we find in conversing with each other. The variety of features is a part of the plan of divine government, and is a striking proof of the tender regard of the Almighty towards us. It is also evident, that both the construction of the body, and the disposal of the several parts, have been done with infinite wisdom. Variety and uniformity are connected together; from whence result the order, proportion, and beauty of the human body.

April 25.

The universal care of God for his creatures.

The birds of the air, the beasts of the field, and the fishes of the sea, are objects of the care of divine providence. In God they all live, move, and have their being. Animals destitute of reason are endowed with organs, strength, and sagacity, suited to their several destinations. By their instinct they are apprised of what might be hurtful or dangerous, and enabled to seek, discern, and prepare the food and habitation most adapted for them. All that they do is in a manner involuntary, and not the fruit of choice or reflection. They are irresistibly impelled to act by those propensities which God has given them for the preservation of their animal existence. In short, there is no species of animals which is destitute of what is necessary for its subsistence and well being.

Though man be of a more excellent nature, yet he comes into the world in a state of greater weakness, and stands in more need of succour than most other animals; he is therefore distinguished by a more marked attention, and greater blessings in the course of divine providence. Almost all things contribute to his preservation. The blessings of providence are distributed among all intelligent beings with impartial love. God has put all things under his feet: all sheep and oxen, &c. that their life and labour may contribute to his support ond convenience.

The vast expanse of air, and the depths of the sea, as well as the fertile bosom of the earth, abound

with proper food for the support of that innumerable multitude of animals which live and move in them. How inexhaustible are the treasures of divine goodness! There is adequate provision made for all the creatures that exist. The system of nature remains the same. The sun constantly maintains his usual heat and splendor. The earth is ever fertile. We have a proper succession of seasons, and the earth yields its annual abundance for the support of its innumerable inhabitants.

We may behold the traces of a kind and universal providence; whether we consider the constancy, the profusion, or variety of the means of subsistence which God has every where furnished. All that surrounds us, all which serves to support and procure us the comforts and conveniences of life, are so many visible means, so many canals, through which the Lord distributes his benefits to us continually. The world is his magazine, and we take out of it all that we want.

Father of mercies, how extensive, how great, how inexpressible, are thy compassions! In thee we live, and move, and have our existence. Thou upholdest all things by the word of thy power. Thy rain refreshes the thorn as well as the cedar. The lot of all men is in thy hand, and through thee alone they can be happy. Thou makest the sun to rise on the evil and on the good. By thy command the breeze refreshes us, the rose embalms the air with its perfumes, the most delicious fruits please the palate, and the dew of heaven revives us. Thou causest the righteous to experience the saving influence of thy grace, while the wicked is driven away

in his wickedness. Penetrated with joy and thankfulness, I would sing praise unto thy name, magnify thy goodness, and render thee that adoration, praise, and glory, which are thy due.

April 26.

On April Flowers.

The wild and melancholy aspect of nature wears off in proportion as the spring advances. Every day brings forward some new creation, and nature approaches nearer to perfection. The tender grass begins to spring up already, and the sheep seek it with eagerness. In the fields, the corn begins to appear, and the gardens themselves begin to smile. Flowers show themselves here and there, and seem to invite us to examine them. The modest sweet-scented violet is one of the first children of spring: having been long deprived of such delicious odours, its perfume is the more pleasing. See the beautiful hyacinth, rising insensibly among the leaves, and exhibiting its flowerets to delight the sight and the smell. Behold the imperial crown also: it casts around it a multitude of star-like leaves; its stem rises very high, and its red and yellow bell-shaped flowers, hanging towards the earth, form a kind of crown, which is surmounted with a tuft of flowers. The auricula, from the midst of its leaves erects its starry flowers; the borders of which excel the richest satin or velvet; it makes amends for the shortness of its stature, by the elegance of its form and the sweetness of its perfume. The tulip dares

scarcely unfold itself as yet, because the night air and the cold rains might tarnish the splendor of its colours. The ranunculus, the pink, and the rose, do not blow till milder days permit them to shew their beauty to greater advantage.

Who can attentively survey these works of the Lord without admiring his wisdom and goodness! In the vegetable kingdom, one species succeeds another from the beginning till the end of the year. While one plant brings its fruit to maturity, nature excites another to propagate, that its fruits may be ready when the former has accomplished its end. Thus there is a continual succession of fruits and flowers; all marks of the Creator's wisdom.

But why are we not permitted to enjoy a greater number of plants at once? The reason is obvious: what would be the consequence if all flowers and fruits appeared at the same time? Some seasons would then become absolutely destitute of vegetables. We should then be deprived of the pleasure which these pleasing progressive changes procure for us; and become disgusted with the sameness that would surround us.

From the contemplation of spring we should be led to think of youth; that fine early season of life. Let sprightly youth consider in these flowers the emblems of their destiny. They are placed in a fruitful soil, and possess a thousand charms, which cause them to be beloved and admired: but have they never observed how soon the violet and the finest flowers fade? The north wind passes over them, and they fade away.

Ah ! young man ! think of the fate that threatens thee. Glory not in thy beauty or strength : life is as grass. Thou now flourishest as the flower of the field : "But the wind passes over it, and it is gone, and the place thereof shall know it no more."—Psal. ciii. 16.

April 27

On the return of Birds.

Whole tribes of birds, a small number excepted, who pass the winter with us, have emigrated from our countries. Some have sought milder climates, and some have retreated into caves and holes of the earth, and other private places. These return to us by degrees : the mildness of spring awakes them from their torpor, and a secret instinct brings back many others, who last autumn undertook a long passage beyond the seas, to find that subsistence and temperature which their constitution required.

In general, those which went away latest, return first. The air is now about to be re-peopled with its winged songsters. Soon the nightingale shall cause the thickets to resound with her melodious notes. The swallow will return perhaps to the very nest which was built the last summer ; and the stork will find again the same place which she had left in autumn. The time of singing of birds is coming, and their return will bring back joy and gladness into our plains and valleys.

Two things may be noted in the emigration of

birds: the first is, that they know exactly the time in which they ought to return. "The stork in the "heavens knows her appointed time; the turtle, the "crane, and the swallow, observe the time of their "coming."—Jer. viii. 7. Another remarkable circumstance is, that these creatures, destitute of reason know exactly the path they should take, and how far they should go. They undertake and finish a voyage of a thousand miles in the most regular order, without compass or provision! Who taught them to follow a certain tract, in an element so inconstant as the air? Who informs them how far they have already gone, and how much of their journey yet remains? Who guides, and nourishes, and provides them with all necessaries for the voyage? Do they not effect what men themselves could not do? Had we to undertake such a long voyage, we should require great experience, succour, directions, and preparations. We could not, by the assistance of reason, the compass, and geographical charts, follow so invariably the road over so many seas and mountains as these birds do, without the assistance of either.

O Lord! we here discover thy almighty influence. Thou hast impressed on the minds of these birds, that instinct which they invariably obey. Thou hast appointed to each, the country, the cottage, and the tree, where he may find his food and habitation.

O Lord! I commit my ways to thy all-wise direction, with the most filial confidence; and should I be obliged to lead a restless and wandering life here below, do thou comfort and support me with the

hope that I shall at last arrive at the place of eternal rest, peace, and happiness; where "one un-
" bounded spring encircles all."

April 28.

On the utility of Forests.

Multitudes have experienced the utility of forests in the past winter, in furnishing them with fuel to preserve them from the effects of intense cold: but this is not their only, nor their principal use. The pleasure which we feel at the sight of the woods, may be one end for which they were created. They are one of the greatest beauties of nature; and it is a defect in any country to be without them. Our anxiety till the leaves appear, and the pleasure we feel when they do appear, convince us how much nature is adorned by them. We must not forget, in reflecting on the utility of woods, the fruit which the numerous families of trees produce. It is true, there are some trees whose fruit does not appear to be of any real use to man; but the trees themselves are always useful, were it only for their shade, their beauty, and their wood.

Besides, if we properly reflect, we shall acknowledge that those trees which we stile barren, are nevertheless serviceable to us: insects, without number, are nourished by their fruit. These again become food for many birds, which afford us the most exquisite dainties. The acorns of oak, and the nuts of beech, and various matters of this sort, are the favourite aliment of swine and wild boars; and by

their seed forests are perpetuated. Who knows but these fruits, properly prepared, might become food for men ? How many animals find food and habitations in the woods ! We should be deprived of many convenient utensils and medicines, were there no wood, bark, and roots of trees. Lastly, what dull uniformity would every where present itself, were it not for that charming diversity of fields and woods ! Forests being of such use to men nature has taken care to perpetuate them. Had their continuance been left to man's industry and vigilance, they would have become extinct long ago. The Creator preserves the trees. He planted, and he supports them. He established them by their strong and widely-spread roots : so that for ages they brave the insults of winds and storms.

God of unbounded compassion ! thy goodness extends over all the earth ! Every where, in forests, in fields, in parched deserts, in the flowery plains, thou hast erected monuments of thy goodness ; for thou art the God of love and mercy.

April 29.

The pleasure which the contemplation of Nature affords.

Nature, with maternal kindness, offers to all her children the chief, the most innocent, and most universal of all pleasures : such pleasure as our first parents enjoyed in paradise. It is only the depravity of men that leads them to seek for other pleasures and recreations. Men often despise the bless-

ings which they constantly enjoy, how excellent so ever they may be; and they think of multiplying and diversifying their amusements. Nevertheless, it is certain that the pleasure I speak of is infinitely preferable to all others. The contemplation of nature affords perpetual charms. This pleasure may be enjoyed without expense, and is equally accessible by the rich and the poor. It is strange that this very thing should lessen its value. So simple are mankind, that they often disregard that in which others have an equal share, whilst, if they acted rationally, nothing should more enhance the value of a blessing than the thought that it constitutes the happiness of our fellow creatures, as well as our own.

How frivolous and deceitful are those far-fetched amusements, which the rich procure with so much trouble and expense, when compared with this noble and affecting pleasure! They still leave a certain vacuum in the soul, which none but God can fill. On the contrary, rich and beneficent nature constantly presents new objects to our eyes. The pleasures of real religion are solid and durable. The resplendent works of God continually furnish us with new objects of satisfaction and delight, and the proper study of the scriptures will crown our felicity. The study of a Christian should be to derive good from every thing. In whatever state he is, he should be content, and enjoy innocency whatsoever surrounds him, without injuring his virtue, or hurting his conscience.

O may we ever prefer this noble satisfaction to all sensual delights! In those days of spring may the

beautiful view of nature affect us more than those seducing pleasures, which flatter the senses, but do not interest the mind. Teach us, O Lord! to acknowledge and feel the divine power and goodness. When we can find thee in all thy works, it opens to us an unfailing source of pure delight. We may then anticipate the joys and glories of paradise, where there is fulness of joy and pleasures for evermore.

April 30.

The Brute Creation ought to lead Men to glorify God.

We should not treat creatures improperly. We ought to make the best possible use of animals: and this can no other way be done better, than by making them subjects to glorify God. All creatures, especially all animated creatures, may lead to this. The magnificence and glory of the Creator are visibly impressed on every plant, tree, flower, and stone. We have only to open our eyes to see this; but it is still more obvious in the animal kingdom. Examine the structure of but one living creature; what art, what beauty, what a train of wonders do we discover in it! These wonders are exceedingly multiplied when we reflect on the almost infinite number and variety of animals.

What gradations, what links, forming one immense uninterrupted chain do we see, from the mighty elephant to the insignificant mite! Among all creatures what astonishing connections, order,

and relations. All is harmony. A superficial attention to the things in nature may convince us of this.

For instance, we see a multitude of animals, all formed in an admirable manner; who all live, feel, and move, as we do: like us, they are subject to hunger, thirst, cold; and who consequently, like us, stand in daily need of having these wants supplied. God has given life to all these creatures; he preserves them, and provides for their necessities. As their parent, he cares for them, and feeds his numerous family. Hence we may conclude, that we should love God, who is mercy itself. If God takes care for sparrows, what will he not do for us? If it be his study (if I may say so) to render the life of irrational creatures sweet and pleasant, what may we not expect from his beneficence? Let the distrustful blush at their anxieties; who, as soon as they are deprived of affluence, fall into despondency, fearing that God will permit them to perish for want.

We may yet reflect further on the instinct of beasts, that we may have an additional motive to glorify God. The instincts of animals all relate to their preservation, and are more particularly seen in the tender solicitude which they feel for their young. Our Lord himself refers us to the tender care of the hen, to point out his most tender and paternal care. How striking is the sight, to see that strong and natural affection which a hen bears to her young ones, and the constant care she takes of them. She will scarcely take her eye off them; at the least appearance of danger she flies to their succour; she

opposes every aggressor with courage; she even risks her own life to preserve that of her young. With her maternal voice she calls and comforts them; she extends her wings to receive and cover them. She neglects herself, puts herself to pain, and thinks of nothing but the safety and well-being of the objects of her love.

Who can avoid seeing here the finger of the Most High! The chicks, and the whole race must infallibly perish without this strong instinct and maternal solicitude. Can it be said that the hen reflects, foresees, reasons, judges, combines, and makes inferences? This is very doubtful. The hand of God here manifests itself without teaching us how it acts. We may therefore conclude, that it is the duty of man to seek in the animals an occasion to glorify God. Let all creatures adore him, and proclaim their Creator's praise.

MAY 1.

The System of the World.

OF all parts of the system of the world, the sun is that which interests us most. His form is spherical, and is composed of a fiery substance which never consumes. That the sun moves round its own axis, is evident from the spots which are discovered in certain parts of it by the telescope. The sun is reckoned 100 millions of miles distant from us. It is one million of times larger than the earth; the diameter of which is nearly eight thousand miles. It communicates light and heat to twenty opaque

globes at least; which revolve round him at different distances, and are called planets. Mercury is the nearest to the sun, and is in a manner buried in its rays; for which reason it is less known than the rest of the planets. A little further off is Venus, poetically called Lucifer, or the morning star; and Hesperus, or the evening star: because she sometimes rises before the sun, and sometimes she sets after him. Our globe is the next in order; the surface of which is composed of land and water, mountains and valleys: the internal parts consist of various strata of different substances.

This earth is the habitation of innumerable creatures, animate and inanimate. The moon revolves in a particular orbit round the earth; and accompanies our globe in the whole circle it describes round the sun: she is fifty times smaller than the earth. On her surface, some spots are distinguished to be lucid and bright; others dark and gloomy. The first are thought to be continents, and the other seas, or deep valleys. Were the moon composed only of one substance, were she a body entirely solid or entirely fluid, she would reflect in the same way the rays she receives from the sun, and we should see no spots in her. Water absorbs a great quantity of rays, and reflects but a few; it is therefore evident, that the obscure parts of the moon are either seas, or very deep valleys, into which the rays of light are prevented from falling by high mountains, or prominent parts of land. Among the light parts of the moon, some are more bright than others, and even cast a shade; for which reason they must be higher than others, and resemble our mountains.

In the lunar seas, some parts are not so dark as others, and which consequently appear to be like our isles.

The four last planets of our system, are Mars, Jupiter with his four moons, Saturn with seven, and Georgium Sidus with his two. Spots are observed also on some of these. Such is the distance of Georgium Sidus from the sun, that he requires eighty-two of our years to finish his revolution. Thus the Sun's dominion, without reckoning comets, extends to more than nine hundred millions of miles! yet this is but a small part of the universe. Each of the fixed stars (which may exceed for number the sands on the sea shore) is probably a sun, equal to ours in magnitude and splendor.

Behold, how the heavens declare the glory of God! With what splendor does the majesty of the Creator blaze forth in these stupendous works, which all invite us to praise his adorable name! What can give us a nobler idea of Deity, than the aspect of the celestial vault? May I never lift up my eyes to heaven, without having the most lively sense of Him who gave being to all things, and who governs them with incomprehensible power, wisdom, and goodness. What then are we, who creep like insects upon a grain of sand, and are even lost in the immensity of creation? Let us humble ourselves before the Maker of all these worlds, these suns, these skies; which, if we attempt to measure, confound our understandings. Let us rejoice to think that the Ruler of the universe deigns to honour us with his protection and paternal care. How great are his mercies towards his creatures.

May 2.

On the Blossoms of Trees.

While at this instant our gardens and fields are adorned with all the ornaments of spring, all Europe appears with equal pomp, and every where presents the most cheerful prospect. The same God that produced by a word all these magnificent effects, has in a few days renewed, and, as it were, created the earth again, for the use and pleasure of mankind. Approach, O man, come and try what thy wisdom and power can execute. Canst thou make a single tree blossom, or call from the earth the smallest blade of grass? Canst thou cause a single tulip to appear in all its beauty? Ye learned artists and skilful painters, draw near and contemplate these flowers; examine them with the nicest attention; is any thing wanted to make them more perfect? Can you find any fault in the mixing of the colours, in their form and proportion? Can your pencil express the dazzling red of the peach blossom? But why do I thus speak? are you even capable of feeling all the magnificence of renewed nature? Have you a just idea of the inimitable art? The flowers alone sufficiently display the power and wisdom of God. In the blossoms of trees there is an infinite variety: though all are beautiful, yet their beauties are different. One surpasses another; but each has some beauty peculiar to itself. God's gifts are bestowed in a sovereign manner: on some he bestows more, on some less, as it respects accessory qualities. One tree, for example, has blossoms of

a pure white; those of another have red streaks, and shades which the other wants. Some, in addition to their form and beauty, have an exquisite perfume; but these are accidental differences, and do not in the least affect their fertility.

Thus we find happiness is not attached to circumstances. Our real welfare cannot be injured by the loss of some accidental beauties. If we be not rich nor reputable, we may, through grace, be acceptable to God, and useful to mankind. If we be fruitful in good works, we possess real beauty. For why are we more pleased with the blossoms of trees, than with the rich colours of the tulip, the auricula, or the ranunculus? It is because the beauty of the latter is transitory, whereas we expect from the former the most delicious fruit. We must not, therefore, confine our wishes to the beauty and exterior charms of a May flower. Beauty, comeliness, the tint of health, and other similar advantages, are not what can procure us desirable and permanent profit. They are of short duration. Let then our chief study be, to act in such a manner, that when the beauty and charms of the body are no more, we may bring forth fruit in old age, and at last be gathered into the garner of God.

MAY 3.

Continual Revolutions and Changes in the Earth.

CHANGE and motion seem absolutely necessary for the preservation of the corporeal world. In the whole universe, there is not the least particle of

matter entirely at rest. We shall soon be convinced of this, if we pay the slightest attention to what passes on the globe which we inhabit.

The earth turns round on its axis every twenty-four hours, and by this rotation all the points of its surface, except the poles, change their situation with greater or less rapidity. Under the line, where the motion is swiftest, all things move more than a thousand miles an hour; though their place on the surface be the same. But besides this, the earth makes its yearly revolution round the sun with so great a velocity, that, according to the most moderate calculations, it flies one thousand one hundred and thirty-six miles every minute; yet its course is not observeable. Motion relative to earthly bodies is more perceptible. Small rivers unite and form greater: these in their turns form torrents and rivers which are ultimately lost in the sea. Nor is that all, plants and animals every where require water to nourish them. The water is exhaled in vapours, which form into clouds, and fall again in rain; and whatever is not transformed in its fall, goes again into the sea, which by the flux and reflux, storms, and torrents, is kept in perpetual motion.

There is not any rest in the atmosphere. An east wind blows continually between the tropics; and though in other places the motion is not always perceptible, yet the barometers and thermometers prove that the air is never perfectly still. Meteors also, of all sorts, show that nature is in constant action. The surface of the earth is likewise subject to frequent changes. The hardest rocks are sometimes split; stones gradually wear and break; some lands

full in, others are overflowed; islands are in some places thrown up from the bottom of the sea; and whole cities have sunk by earthquakes; little hills are washed away by waters; valleys are filled up; marshes grow dry, and are covered with trees; the bottom of the sea becomes firm ground. Darkness and light, cold and heat, drought and wet, succeed each other by turns.

This continual revolution of sublunary objects is further observable, if we consider the changes visible in animals. It is said, that man loses daily about two ounces and a half in perspiration. This loss is repaired by other particles so that at the end of ten years a man is clothed with a body entirely different. All plants and animals feed, grow, propagate, die, and corrupt.

Thus all things on earth are in motion: they grow and decay by turns. In a word, to be born, and to die, is the sum of all that passes on the theatre of this world. But there is order and design in all this: nothing happens by chance. All things act according to certain laws, which tend to certain ends; so that God is glorified in all things. These continual revolutions are useful warnings: they teach us that this is not our rest, that all things here are vain and uncertain, that life is short, and that we are but sojourners and travellers on earth.

With what consolation may not my soul be penetrated, in the midst of all the revolutions of time, if I lift up my eyes towards thee, O my God, and stay myself upon thee; for thou art both immutable and eternal. Let the mountains be shaken and fall down; let the sea be troubled, and the waves

roar; let nature go to wreck; still thou art the same, and thy years have no end.

May 4.

An invitation to seek God in the works of Nature.

Awake, O my soul, and arise from that profound slumber in which thou hast been so long plunged, and be attentive to surrounding objects. Consider thyself; consider all creatures; consider their origin, their form, their use, and a thousand circumstances, which should fill every attentive observer of the works of God with admiration. When thou lookest on the sky, its vivid and varied colours, the stars which shine so bright, the light which discovers to thee objects around, ask thyself whence all these objects proceed? Who enamelled this immense arch of the heavens? Who has placed in the firmament these innumerable fires, these stars which, though at so prodigious a distance, dart their rays even to our world. Who ordered the stars to move with so much regularity, and the sun to give light and heat to the earth? Is it thou, adorable Creator! Yes, it was thy mighty hand that called forth all things, and ordained them to exist. How great must thy power be, O Lord God! which has drawn all these things from the depths of nothing! Stupendous mountains! what mighty hand has established your foundations? Who adorned you with forests, and raised your heads above the clouds? Who covered your tops with snow and ice? Who has drawn from your bowels those rivers and foun

tains which moisten and fertilize the earth? It is thy hand, O my Creator! which has wrought all these wonders; and I adore that divine hand with sentiments of gratitude and love.

Flowers of the field, who dressed you in all your beauty and splendour? How comes it to pass, that a little earth, and a few drops of water, produce you? Whence those different odours which embalm the air and delight us! This, O God! is thy work; and all things proceed from thee.

But what a multitude of miracles do I perceive, when I contemplate myself! How is it that a handful of dust could become a well-organized body? How is it that one part of the body should see, another hear, another feel? How is it that I have the faculty of communicating ideas and desires? How is it that a little food bruised by the teeth should procure so many agreeable sensations to my soul? In all these incomprehensible wonders, I acknowledge thy hand, O my heavenly Father! Thy wisdom, power, and goodness, all combine to make me happy.

MAY 5.

The dawn of Day.

THE dawn discovers to the world a new and magnificent creation. By the shades of night we are deprived of the sight and enjoyment of the earth and sky: but when day-light returns, all nature seems renewed and embellished. The earth is suddenly arrayed in all its beauty and magnificence;

the mountains crowned with forests: the hills encircled with vines; the fields covered with crops, and the meadows watered with rivulets. The horizon begins to glow, while the clouds are all tinged with a variety of the loveliest colours. At a distance, flowery vales are discovered; the light vapours appear like gold, and the drops of dew which cover the flowers, assume the pleasing brightness of pearls. As the light increases, the spectacle becomes more magnificent. We proceed from one degree of light to another, till nature exhibits to us her noblest object.—The sun rises! the first ray has escaped over the mountains, and has darted rapidly from one end of the horizon to the other! this is followed and strengthened by multitudes more. By degrees the disk of the sun is disengaged; he arises complete; he advances in the heavens, and runs, as a strong man, his race, with majesty which the human eye cannot sustain. What would any one think who should see this delightful scene, suddenly, for the first time, from the top of a hill? What would he do? Would he not fall down and adore that God, who causes the dawn to bring forth? "Glorious Being! (he would exclaim) in the bright-"ness of the dawn, I acknowledge thy wisdom and "power. Like the lark who salutes the morn, I "would soar towards thee. O Lord! who art the "Father of the whole creation. All around invite "me to raise my soul towards thee, with the most "lively transports of grateful joy. At this moment, "while the sun is darting his first rays upon the "earth, millions of creatures praise and adore thee. "Can I then still remain dumb? From thee the

"beauty of the morn proceeds: yes, from thee, "who art the source of all light! Thou hast given "those lively colours, and impressed a sense of them "upon my soul. In the splendour of the rising sun "I seem to behold thee. If thou wast not, there "could be no dawn, or sun, or creation; but thou "art from everlasting to everlasting."

How much are they to be pitied, who, through indolence, never give themselves the heavenly pleasure of contemplating the rising sun! O that they could but feel, that the aspect of beauteous nature can fill the heart with holy joy and profound veneration for the Creator! O that a ray of divine light might dart into their minds, and become the happy commencement of a Christian life! Then would their souls have peace, and they would praise God evening and morning, and at noon-day.

MAY 6.

The wonders of Vision.

No exterior objects can become visible to us, unless some rays of light proceed from them and fall upon our eyes. Those rays which enter into our eyes, pass through the cornea, where they are refracted, and become still more so as they pass on the crystalline humour. Then the rays touch the optic nerve, which is as sensible as the finest string of a harpsichord. This nerve, by its motions and vibrations, produces different sensations in the soul, and excites perceptions and ideas in it, conformable

to the impressions made on the brain by outward objects. This subject is worthy of attention. The image of all outward objects is painted on the retina, upside down, and yet we see all things right, and in their real situation. Though the largest objects are painted on our eyes extremely small; yet we see every thing according to its real size. How does it happen, that when from the top of a tower we perceive thousands of houses below us in a large city, that each is painted so exactly in our eye, on a surface scarcely three times as large as the head of a pin? So many millions of rays coming through a small aperture are re-united in the retina, which covers the bottom of the eye, without the least confusion; though they preserve among themselves the same order with the points of the objects from which they proceeded. Nor is this all: look from the top of a mast upon a fleet in the open sea, in full sail, contemplate the sea itself, and how many millions of waves will you behold! and yet each of them, small as they are, reflect a mass of rays upon the eyes.

Finally, let a person go to the top of a mountain in a clear day, and view the surrounding country. Every tree, yea, every blade of grass, send rays of light to the eyes, without which it would be impossible to see the beautiful verdure of the fields beneath. But is it not more wonderful still, that though we have two eyes, we do not see double? Remember further, that those objects which we see are not only visible to us; (we are justly surprised at the number of rays which they transmit to so small a space as the pupil of the eye;) but they send as

many to every similar quantum of space in the whole surrounding atmosphere. How seldom are these things considered! The habit of seeing as soon as we open our eyes, causes us to consider this operation as a thing simple in itself, and easy to comprehend: yet it is utterly out of our power fully to explain the manner in which we see objects. We know indeed how the image forms itself in the bottom of the eye, and that all the parts which compose it contribute to it; but that is not enough: for, the eye itself can have no idea of what passes in it. The impression must reach the brain; and in order to that, the rays must paint the image on a coat woven with nerves; which correspond with those of the brain. In this way the motion, impressed by the rays on the nerves of the retina, is transmitted by the optic nerve to the brain. But who can describe what passes there? We do not know either the nature of the brain, or the use of its several parts. These astonishing wonders are the work of a divine power, united with infinite wisdom and goodness.

MAY 7.

Spring renews the face of the Earth.

WHAT a surprising revolution takes place in every part of nature! And how great is the goodness of that God, who causes the seasons to succeed each other with so much order and regularity! Now the earth resumes its verdure and fertility; all creation becomes animated, and seems to feel new joy and gladness. But a few months since, the whole sur-

face of the earth was a barren desert; the valleys which now yield so beautiful a prospect, were buried in a deep snow. The mountains, which now elevate their grey tops above the clouds, were then covered with snow and ice, and enveloped in impenetrable fogs. In those verdant walks which the nightingale now inhabits, we saw nothing but dry lifeless branches. The brooks and rivulets, which now run murmuring along, were arrested in their course by ice, which rendered them immoveable. The heavenly songsters were insensible in marshes and caves, or gone to warmer climes. A mournful silence reigned every where; and, as far as our sight could reach, we saw only dismal solitude. But nature now awakens from her inanimate state, and spreads pleasure and a thousand charms around us. The sun approaches our globe, and the whole atmosphere is penetrated with a vivifying warmth. The kingdom of vegetables proves its beneficial effects; and the earth produces grass and flowers of every sort. The face of the earth is now renewed and embellished. Let us trace things to their source. Lord, thou visitest the earth, and the valleys assume a smiling appearance. Thou sprinklest them with dew, to enrich them, and thy fountains are always full.

At thy command the crops ripen, and we are filled with food and gladness. Thy blessing is upon our furrows, and the rain refreshes the dry land. Thou makest it soft with showers, blessest the spring of the corn, and crownest the year with thy goodness. Under thy footsteps the flowers spring up, and blessings and fertility follow thee.

Thou waterest the pastures of the desert, and renderest the little hills fruitful. Thou coverest the hills with flocks, and the valleys are filled with corn. The earth is full of thy goodness. Blessed be thy name. Let all that hath breath praise the Lord.

I behold in this revolution which the spring brings with it, an emblem of the salutary change which a soul experiences when under the converting influence of the divine Spirit. In its natural state, it had no real beauty; but its faculties were all totally depraved: it was unable to produce pious fruit. But how happy is its state since it has felt the sweet influences of the grace of God! Ignorance is dissipated; folly and vice disappear; the passions are subdued; the heart is filled with religious sentiments, the fruits of which delight and edify mankind. May every reader be the subject of this renewing grace! Amen.

MAY 8.

On the generation of Seeds

THE changes in nature at this season are not all visible. The seed which was cast sometime ago into the ground, swells, enlarges, and the plant bursts forth and shoots up by degrees. This operation is the more worthy of our attention, because it is the source of all the vegetable beauties that adorn the earth in spring and summer.

The seed is composed of different parts, according to the different species; but the principal part is the germ. Every germ has two parts: the one

simple, which becomes the root; the other scaly, which rises and becomes the stalk and the head of the plant. The body of most grain consists of two parts, which are called lobes; these are filled with a farinaceous matter, which serves for seminal leaves to the plants. Mosses have the most simple seed: having only a germ, without pellicles or lobes. Air, and a certain degree of humidity and warmth, are absolutely necessary to cause the grain to bud. The increase of heat and the difference which may be observed in the taste and smell, seem to discover a certain fermentation. By means of this preparation the mealy substance of the lobes becomes proper to nourish the tender shoot.

From experiments which have been made with coloured juices we know that this subtance sucks in a moisture, which furnishes a proper nourishment, with the assistance of air and heat, till the plant has acquired strength enough to profit by the juices which the root procures for it. Then the exhausted lobes gradually dry away and fall off, when the plant needs them no longer. Certain herbs which grow on mountains, are of a very particular nature. Their duration being short, it would often happen that the seed would not have time to ripen: therefore, in order to preserve the species, the bud, which contains the shoot, is formed at the top of the plants, puts out leaves, falls off and takes root. But the plant would run too great a risk when it comes out of the earth, were it at once exposed to the outward air, and the power of the sun. Its parts therefore remain folded, lying close to each other; nearly as they were in the seed: but as the root grows

strong, and extends on all sides, it furnishes the superior vessels with an abundance of juice : by means of which all the organs speedily unfold themselves. The plant is almost gelatinous at first, but it gradually acquires more consistence, and keeps increasing in size. These remarks are sufficient to shew us how many preparations and means nature makes use of to produce one single plant. When we therefore see a seed springing up, we ought not to think, as is too often the case, that it is not worthy our attention. Here the wisest men may reflect and wonder.

The order with which the plants so regularly succeed each other, is a proof of God's infinite wisdom, which is seen even in the smallest things. Here I would reflect on my mortal nature : it also contains a certain germ, which grows up with time, increases and bears fruit. O that I grew more and more in the likeness of Christ my Redeemer !

MAY 9.

On the Chick in the Egg.

MUCH praise is due to naturalists for taking the trouble to make inquiries into the generation and propagation of animals. Nothing in nature tends more to display the glory of God, than the observations made on the wisdom that appears in the production of animated beings. The less we are able to understand all his works, the more earnestly we should seize the opportunities which present themselves of knowing some of them. With this view

let us consider the formation of the chick in the egg according to the observations of the greatest naturalists. Scarce has the hen sat on the egg twelve hours, when some linaments of the body of the embryo chick begin to appear. The heart begins to beat at the end of the second day. At that time it has the form of a horse-shoe; but no blood is yet seen. We discern at the end of about 48 hours two vesicles with blood, the pulsation of which is very evident. One is the left ventricle, the other is the root of the great artery. One auricle of the heart appears at the 50th hour, which resembles a lace folded back upon itself. The beating of the heart may now be observed in the auricle, and afterwards in the ventricle. At the end of 70 hours, the two wings may be distinguished, and on the head two knobs for the brain; one for the bill, and two others for the forepart and hind-part of the head. Towards the end of the fourth day, the two auricles, visible already, approach nearer to the heart than they did before. The first auricle that appears, seems to have two horns; but it afterwards appears to be auricles. About the fifth day the liver is seen. The first voluntary motion is observed at the end of 131 hours. At the end of 138 hours, the lungs and stomach become visible; and at the end of 142, the intestines, the loins, and the upper jaw. At the end of 144 hours, two ventricles may be seen, and two drops of blood instead of one, which was seen at first. On the seventh day the brain acquires some consistence. At the 190th hour of incubation, the bill opens, and the flesh appears in the breast. At the 194th hour, the sternum

(i. e. the breast-bone) is seen. About the 220th hour, the ribs come out of the back; the bill and the gall-bladder become visible. After the 236th hour, the biles become green, and if the chick be taken from its integuments, it can move itself insensibly. The feathers begin to shoot towards the 240th hour, and the skull becomes gristly. At the 246th the eyes appear; and the ribs are perfect at the 288th. The spleen approaches the stomach at the 331st hour. At the end of 355 hours, the beak opens and shuts; and about the eighteenth day the chick utters its first cry. Its strength then gradually increases, till it sets itself at liberty by breaking the prison in which it was confined.

How adorable is the wisdom of God! All the above progressions are done according to order, and each carries its own reason with it. For instance, if the liver be always formed towards the end of the fifth day this is founded on the preceding state of the chick, and on the changes that were to follow. The whole embryo must suffer, if any part of the body were to appear sooner or later. This must certainly be the work of a supreme Being. How wonderful is it, that there should be in an egg the principle of life—of a living creature; that all the parts of an animal's body should be concealed in it, and require nothing but warmth to unfold and quicken them. That the chick should be regularly and constantly formed the same way!—That the same change should take place in more than twenty eggs exactly at the same time!—That changing the position of the egg does not injure the fœtus, or prevent its formation! in fine that the chick when

it is hatched, should be heavier than the egg was before; nor are these all the wonders manifested in the formation of the chick: many questions might be asked on the nature of generation, which would perplex and confound the human mind. Let us, however, make a good use of what little we do know, by adoring the wisdom and goodness of the Creator, and by praying that we may be made wise unto eternal salvation.

May 10.

On the Buds of Flowers.

I DISCOVER on all sides a multitude of flowers in the bud. At present they are closely shut up in their intrenchments. Just emblem of the wretched miser who lives by himself, who centres all in himself, and who makes his private advantage, or personal pleasure, the centre of his desires, and the confined circle of his actions. But the buds of the flowers will soon be opened by the penetrating rays of the sun, and we shall be presented with a magnificent sight. What delicious perfume will they then exhale! Thus when divine grace shines upon the miser's soul, he will soon become beneficent: the heart of stone shall be turned to a heart of flesh. The social affections are produced by the mild influence of the Sun of righteousness, and the heart sensibly expands and takes in all mankind.

O lovely youth of both sexes! I think of you when I reflect on the buds and blossoms. The

beauty and vigour of your minds are not yet unfolded. The fond hopes of parents and teachers may never be realized. When you behold the buds, say, "These are emblems of me. My parents "and masters are looking for the unfolding of my "talents and faculties; they give me all necessary "instruction and information; they watch over me "and pray for me hoping to see the blossoms un- "fold and the fruit appear, that I may become their "joy and consolation, and render myself useful to "society. I will strive to fulfil the pleasing hopes "they form; I will endeavour, by the instructions "they give me, to become every day wiser and bet- "ter, and more amiable. For this purpose, I will "flee from youthful lusts. In the morning of my "life, I flourish as the bud which opens insensibly. "My heart beats with joy; indulges the most pleas- "ing hopes, and looks forward to a blessed futurity. "May I be kept from giving a loose to foolish pas- "sions and desires, which would corrupt my young "heart and blast their expectations!"

MAY 11.

The industrious Bee.

ONE of the advantages of the season is, that it affords us an opportunity of observing the industry and labours of the bees. Certainly a bee-hive is a delightful sight to a lover of nature. One can hardly eave off contemplating that laboratory, where thousands of workmen are employed in different ways. To see their order and regularity, and to behold

their magazines well stored with what their subsistence requires in the winter, is enough to surprize any thinking mind. But that which most merits our attention is, the indefatigable assiduity and uninterrupted labours of this little republic. Bees give us an unequalled example of diligence and activity. As soon as winter is over they appear, even when it might still be feared that the cold would hurt them and benumb their delicate limbs. They collect a little honey for their food, even when the juices of the flowers which begin to blow are not sufficiently digested by the sun, so as to furnish honey in plenty; but as summer approaches, they double their care and activity. They labour incessantly. So indefatigable are they in the construction of their cells, that we are assured that a comb with double cells, set back to back, is formed in twenty-four hours, so that three thousand bees may lodge in them! The members of this republic divide all the work between them. While some collect the wax, prepare it, and fill the magazines, others are differently employed. Some take the wax and use it to build their cells; others knead it, and polish and perfect the work. Others gather the honey from the flowers, and lay it in the hive for their daily subsistence, and for future occasions. Others close their cells with a thin covering of wax, in which they keep their winter stock. Some carry food for their young ones, and shut up the habitation of those small worms with wax, which are near the time of transformation, in order that they may work more quietly. Some carefully stop up, with a glutinous substance, all the openings in the hive, and plaster over all the weak places to

keep out the wind and insects. Some drag out of the hives all the dead, for fear of infection: or if they be too heavy to be removed, they cover them over with a sort of bird-lime, or wax, and cement it so, that while they corrupt under the crust, no bad effluvia may be exhaled.

But we should emulate as well as admire these little creatures. We have many more motives to diligence than they. We have immortal souls, of inestimable worth. The fruit of our labours extends to eternity itself.

Let us never be backward to do good; but with zeal and fidelity let us acquit ourselves of the duties of life.

MAY 12.

How God has provided food for Animals.

THERE is no earthly animal, from the elephant to the mite, that can live without food and nourishment. From the eagle to the gnat, nothing that flies can exist without it. From the leviathan to the worm, no reptile can subsist without eating. From the whale to the oyster, there is nothing in the waters to which nourishment is not necessary. But the God that made them has also provided for their subsistence; and this food is always suited to the different natures of the variety of creatures that exist. In this respect, animals may be divided into three different classes. The first includes those who live on the flesh of others. Some of these, as the

lion, like quadrupeds only; others, such as the polecat, like fowls; others, as the beaver, like fish; and different kinds of birds feed on insects. In all these, there may be some exceptions; but in general it is certain, that each species has its particular food, designed for it by the Creator.

The second class, includes all those animals which seek their food among vegetables. Grass is preferred by some animals, and others prefer fruit-trees; and a remarkable difference is found even among those who like the same plant. Some take the root, some the leaf, some the stalk, others the pith, the seed, or the whole fruit; and some are found which devour the whole plant.

The third class feeds on minerals: these are mostly insects. Some of them feed on earth, others on stones; and most things in the mineral kingdom serve for food, directly or indirectly, for different insects.

How just were the ideas of David, when he said, "The eyes of all wait upon thee, O Lord, and thou "givest them their meat in due season. Thou "openest thy hand and satisfiest the desires of every "living thing." Psal. civ. 27, 28. This proves that the goodness of divine providence extends over the whole universe. How astonishing is the number of animals which exist! Nature teems with life; yet all creatures find their daily food, and no part of the produce of the earth is useless.

Now if God takes such care for the irrational parts of the creation, what will he not do for us? O ye of little faith, ye are anxious, restless, and discontented; but go and reflect on the goodness of

providence, displayed in the preservation of animals, and learn to trust in God. See the fowls of the air, the fallow deer on the rocks and in caves, the beasts of the field, and the fish in the sea, they all find food and habitations adapted to their nature. If then the meanest worm is not overlooked, is it possible that God should forget his creatures like us, formed for immortality?

MAY 13.

On the Senses of Animals.

THE organs of sense, in all animals, are arranged in a manner conformable to their nature and design. By these they can acquaint themselves with objects at hand, or at a distance, can provide for their necessities, and avoid the dangers to which they are exposed.

The sense by which animals form ideas of corporeal objects, as soon as they touch them, is called feeling. This sense has its seat under the outward skin, which is covered with the extremities of a multitude of nerves. Serpents, birds, and fishes, appear to have no external feeling. The organs of taste are chiefly the tongue and the palate; which receive the impressions of relish; but the papilæ of the nerves are the immediate instruments in this case, as they are in that of feeling, and there is a great analogy between these two senses.

The membrane which lines the inside of the nose is the organ for smelling. By means of the ramification of the nerves, which are spread in this mem-

brane, we perceive those odoriferous vapours which float in the air. Animals which require a more delicate smell, are endowed with a greater perfection in this organ. Perhaps worms, and fish, and insects are entirely destitute of any, yet probably in the latter the horns may be the organ of smell. The beasts, by means of their smell, find all that is necessary for the preservation of their life; the birds and reptiles find their food, and many animals are warned by it of the approach of their enemies.

By hearing, animals become sensible of the tremor and vibration of the air. The structure of the ear is not the same in all beasts. The lizard, and some others, have two tympanums. Others want several of the instruments of hearing, which are common to the major part of animals. Probably neither birds nor fish have that part which is called the snail, or shell; and perhaps worms and insects are absolutely deaf. The eyes are the organs of sight. Except the scuttle-fish, the hedge-hog, and some others, all reptiles are without eyes. On the contrary, all insects have more than two. The spider and scorpion have eight. Some others have them by thousands, commonly collated into two orbits. A fly has sixteen thousand eyes, a beetle, six thousand three hundred and sixty-two; butterflies, thirty-four thousand six hundred and fifty! This profusion of eyes is a recompense for their being stationary. Fish have none of the aqueous humour; but their crystalline is almost entirely globular. The form of all eyes indeed is round; yet there is a visible difference in their roundness. Even the situation in the head is infinitely varied, according to the

designs and necessities of the animals. In man, who sees little but what is before him, the eye is placed in the forepart of the head; and is so constructed, that it can receive impressions of the whole semicircle of objects before him. On the contrary, in birds, the eye is so placed, that it can admit almost the whole sphere of objects which encompass it. Hence they are better able to procure their food, and to shun the dangers to which they are exposed. The ear of man has that figure which best corresponds to his upright posture. In birds, its posture is most proper for flight; as it does not project, but lies close and covered.

What wisdom, what economy, what astonishing art are manifested in the arrangement, and in the disposition of the senses of animals! Yet, perhaps we only know the smallest part of this wonderful mechanism; and most of our observations ought rather to be called conjectures than discoveries. Could we see further into these mysteries, we should have additional reason to adore. Instead of despising animals we ought rather to view them as a mirror of divine power and wisdom. For even the animals afford us evident proofs, that the God who made all things is great in counsel, and excellent in working.

MAY 14.

Regularity in the succession of Flowers.

ALL the plants appear on the earth in the order prescribed them. God has exactly determined the

times when one is to unfold its leaves, another to flower, and a third to die away. Some weeks ago, we saw the whiter winter blossom, or early violets spring up, which was the first to afford delight to the florist. The saffron blossom appeared but timidly, because it was too weak to bear the sharp winds. With it appeared the sweet violet, and the auricula shewed themselves in all their brilliancy. These and some others are the vanguard of the army of flowers. Their arrival was agreeable, and they announced the coming of a multitude of other flowers.

Other children of nature now present themselves; not all at once, but in successive order. Each month displays its peculiar ornaments. The tulip begins to develope its leaves and flowers, and the beautiful anemone will speedily form its full round dome.

The ranunculus will soon expand all the magnificence of its leaves, and charm the eyes of its beholders. And to crown this amiable troop of flowers, the rose will open and blossom with all the beauties which distiguish it; the pink will shew itself with superior elegance.

Here we may stop, and reflect on the wise and beneficent designs evident in this succession of flowers. Were they to flourish all at once, there would sometimes be a superfluity, and at other times a total want. Nor is this all: for as some flowers are always fading, their loss is made up by new ones, which are continually rising in our gardens.

Stupendous goodness of the Creator, thus to favour mankind with a constant succession of benefits! His blessings are not only multiplied, but

rendered constant and lasting. We are led through paths of flowers. They spring up under our feet wherever we go, to enliven and soften our journey through life.

In the same order in which flowers succeed each other, so does the human race. The generations of men have succeeded each other from the beginning of the world, on this great theatre, in the order, time, and place, allotted them by the Creator.

As some come into the world, others return into dust. How soon may it be my turn! May death at last find me prepared, that I may depart and dwell with Christ, which is far better. May I also leave behind me the perfume of a good name, equal to that of the pink or the rose. Amen.

MAY 15.

The Zoophites.

THE zoophites, or animal-plants, are nothing but insects; but by reason of their outward form, their fixedness to one place, and their producing themselves by buds and seeds, they bear a strong resemblance to real plants. These singular animals may be multiplied by grafts or slips. They discover their animal nature in nothing but the sensibility and voluntary motion observed in them. Zoophites are attached by a kind of root to the sea, or to the waters in which they live. Many grow in stony and chalky places; some are surrounded by a shell, which resembles horn, and others are soft and fleshy.

This they all have in common, that without any preceding connection, new zoophites spring out of the surface of their bodies. While these young ones are fastened to the stalk, they form one single animal. By it they are nourished, and nourish it in their turn; but when once they are detached from the stem, they have a proper existence by themselves. The zoophites also multiply in a way that resembles the generation of plants. They form a kind of bud, which contains a young animal, and which grows some time with the stalk; but at last falls off and becomes a perfect animal. Could we ever have thought that there were animals which resemble plants, and produced like them? From the ideas we have generally had of animal existence, could we ever have supposed that the brain, the heart, the stomach, and the intestines, necessary to life, should produce themselves? Or could we ever have suspected the existence of an animal which had neither brain, heart, veins, nor arteries; which from end to end is but a hollow tube, which appears to be all stomach, all intestines and whose very arms and legs are stomachs and intestines? Could we ever have thought of an animal that could be ingrafted like a plum-tree; turned inside out like a glove, and which produces its young as buds from brsnches? The man who could have hazarded such ideas half a century ago, would have passed for a mad-man. Nevertheless, it is now incontestible, that there are such animals, which not only resemble plants in their outward form, but also in their manner of perpetuating themselves. Natural history has gained a great deal by the discoveries made in the begin-

ning of the last century. We may even venture to say, that it has given us enlarged ideas of the power of God. Since the zoophites have been discovered, we have new proofs that the works of God are separated by very narrow limits; and that it is almost impossible exactly to determine where the animal kingdom ends, and where the vegetable begins. It is commonly believed that the difference between animals and plants consists in this, that the latter have neither feeling nor motion; and that the former have both. But how faint are the distinguishing shades; how almost imperceptible the line that separates the two kingdoms, when we reflect on the discovery of the zoophites! Nature every where gives us a glimpse of infinity, which is the proper character of its great Author.

Infinite Being! who can conceive the immense extent of thy dominions? or even know the whole of any single part of it? Future ages may discover still greater wonders. Let me study to know thee more and serve thee better, that I may live to thy glory, and die in thy favour.

MAY 16.

The pleasure of Agriculture and Gardening.

THE culture of fields and gardens is one of the most agreeable employments, and perhaps the only one where the toil is recompensed with a thousand pleasures. Most works confine men to a room or shop; but he who labours in the fields, enjoys the pure and open air, and breathes freely on the mag

nificent theatre of nature. The earth enamelled with flowers is his carpet, and the pure azure sky is his canopy. He breathes a pure uncorrupted country air. His sight is pleased with a thousand agreeable objects, and his taste is delighted with pure and real pleasures. Soon as day-break opens the brilliant scene of creation in the morning, he hastens to the field or garden to enjoy it. The dawn proclaims the near approach of the sun. The points of the springing grass shine with dew-drops, brilliant as diamonds. He is refreshed and embalmed on every side with delightful perfumes, exhaled from the herbs and flowers. The air resounds with the songs of birds, expressive of their joy, their love to each other, and their happiness. Their concerts are hymns of praise to that great Being on whom they are dependant. What grateful joy must such delightful objects inspire! and what can be so delightful an employ as to contemplate the perfections of God and the beauty of his works! What further contributes to render agriculture and gardening singularly pleasing is, that an infinite variety of objects, labours, and occupations, attach us to the work and prevent our being disgusted with it. How great is the variety of plants, fruit, herbs, and trees which present themselves to us under a multitude of forms! Sometimes one beholds the plants springing out of the earth; others rising high and unfolding themselves, and others in full bloom. New objects appear on every side: the heavens above and the earth beneath, afford an inexhaustible fund of pleasure and delight.

O bless the Lord, consider his works, and see

MAY.

Blind chance could never produce such a masterpiece &c. May 17.

him in each meadow, and in all the operations of nature. It is he who has fixed the return of spring, and by whose goodness the granaries are filled with corn. He is the source of all good. Praise the Lord! Behold the forests, the rivers, the valleys; they all discover traces of his goodness. In fine, you may every where meet with the Lord of the universe.

MAY 17.

On the Tulip.

THE tulip has certainly the finest form of all flowers. No silk-mercer in the variety and beauty of colours, or the mixture of light and shade in his silks, can rival the perfections of this flower. Its height, its form, its colours and its drawing, make it the queen of flowers. How astonishing is the variety among the millions of tulips which annually flourish! From a tulip in full bloom, we may certainly infer the existence of a wise and gracious God. Blind chance could never produce such a masterpiece of nature. The tulips are produced and perpetuated by root; but whence came the first production of this machine, and that first arrangement, of which all subsequent revolutions have been only the developement? We must necessarily admit an intelligent cause, whom we call the Creator of the world. It requires as much wisdom and power to create one tulip, from whence twenty others proceed, as to create twenty of them at once: for the new-comers already must have existed in their fore-

runners, and their form and number must have been determined. When we therefore view a bed of tulips, let us not only admire their beauty, but the wisdom of God by which they were created. Not withstanding the beauty of the tulips, they lose some of their value when it is considered that they are not odoriferous. If we place the pink beside it charmed with its perfume, we forget the variegated drapery of the tulip. Just such is the fate of persons who are endowed with beauty, and who set off their charms with every ornament; but are destitute of good sense and religion. An amiable disposition exceeds eternal beauties. The latter captivates but for a very short time; but the beauty of the mind is perpetual. A pious soul is pleasing both to God and man. It is formed by the rules of wisdom, and innocent is its ornament. It is an old adage,—"The finest flowers soonest fade." In a little time, nothing of that blooming tulip will remain but a withered dead stalk. Its beauty and its life last only a few weeks: age destroys its charms; its leaves fall off; its colours fade, and the tulip is reduced to a mere skeleton. What an emblem of a beautiful virgin! and what an useful lesson for us! How little are exterior charms to be depended on! How frail and uncertain is beauty! How near is the approach of death! What is our life but the life of a flower! "Man, who is born of a woman, "is of few days and full of trouble; he grows up "and flourishes as a flower, and speedily withers "away."—Job xiv. 42. Let me so live, that when I come to die, my soul may ascend to heaven, and good people weep over my grave.

MAY 18.

Reflections on Grass.

HOWEVER beautiful the flowers may be, which by the care and industry of man are cultivated in our gardens, we shall know little of the wonders of the vegetable kingdom, if we confine our reflections to the parterre. Every field is a scene of the wonderful works of God. Can any thing be more astonishing than the prodigious quantity of grass which is found in one meadow? If a meadow was a thousand yards in length, and of equal breadth, its surface would then be a million of square yards. If in stepping we cover ten turfs of grass, then a square yard contains a hundred of these turfs. Then it will follow, that in casting a glance over that meadow, we see at once an hundred million of these curiously formed machines. Suppose each turf has a hundred tubes, by means of which it imbibes nourishment from the earth; then there would be ten thousand millions of perfect and regular tubes! Thus the blades of grass far exceed the number of plants and flowers cultivated in our gardens. Why are the productions of the vegetable kingdom thus multiplied? Why from each species of grass does such a multitude spring? Certain it is that beasts as well as men may find support. Properly speaking, the fields are a magazine for animals. It may be observed further respecting grass, that it neither requires sowing nor tillage; but constantly grows, independent of our care. In the first creation,

God so provided, that a sufficient quantity of grass should never fail. "Let the earth bring forth grass, the herb yielding seed," was the Creator's word; and it is still obeyed.

There is a wise providence manifested in the colour of grass. Were all fields white or red, who could for any length of time endure their splendor? Were the prevailing colour more obscure and gloomy, how dismal would the whole face of nature appear? Green is between both colours; it agrees with our eyes, and pleases and refreshes them. What a variety of shades are then in this colour!—a proof that God has provided for our pleasure, as well as for our convenience. May the proofs of divine wisdom and goodness, which are daily placed before our eyes, never render us cold and indifferent; but may the reason which God has given us be employed in sounding the depth of his wisdom, as it shines through all his works! Whenever we walk in the fields, let us indulge these meditations, and say, "Lord, with what wisdom hast "thou formed these plants! With what goodness "dost thou dispense the rain and the sun-shine, "to promote the growth of grass, and to enliven all "nature! I bless thee for them; but more especially "for thy redeeming love, and will bless thee for ever "more."

MAY 19.

Sentiments excited by the contemplation of the heavens.

WHO but a Being of unbounded intelligence and power, could have formed this superb vault which is over our heads? Who could have given being and motion to these immense globes, that perpetual motion whose swiftness is inconceivable, and which the smallest body could not have of itself? Who ordered these astonishing bodies of heavy and lifeless matter to take different forms? From whence proceeded that connection, beauty, and harmony which shine through every part of the whole! Who regulated all things so exactly, according to the number, weight and measure? Who has prescribed to the immense bodies the laws which could not be discerned but by the most sublime genius? Who has measured those vast circles, in which the planets move without ever deviating even a hair's-breadth? Who put them into that course which they run, and are to run to the end of time? These questions all lead us to thee, thou adorable Creator! Self existent, independent, and infinite Being! it is to thee the heavenly bodies owe their existence, their laws, their arrangement, their power, and all the advantages they procure to the earth!

What sublime ideas arise in my mind when I contemplate these grand objects. If the space where so many millions of worlds move cannot be measured by our understanding; if the globes which run their prodigious course there are of a size to

astonish us; if the fabric of the universe is of such immensity, that all our ideas are lost in it, what must thy greatness be, O God! and who can find thee out to perfection? If the heavens and all their hosts have so much magnificence, majesty, and beauty, that the eye can never be satisfied in contemplating, nor the mind with admiring them; what must be thy beauty, infinite Creator, of whose splendour and glory these creatures are but a shadow! How boundless thy knowledge, since thou seest through the immensity of space, and all bodies in it, with a single glance! Thou hast conceived and established all the laws which the universe was to observe! How great must be thy power, by which all thy plans are realized. Thou guidest and directest these stupendous bodies; thou animatest them by thy breath, and preservest them by thy almighty word.

But has God given us such proofs of his power and goodness for nothing? Shall we reap no benefit from it? Is not all this done in order that intelligent creatures should notice it, reflect upon it, and make it the subject of their contemplations? If we honour those that have talents to execute great and beautiful works; with what respect, what profound humility ought we to prostrate ourselves before that God who has constructed the magnificent fabric of the universe, and displayed so much majesty and glory in it? The heavens declare his greatness, and proclaim him Lord of all; and shall man alone refuse to obey the King of the universe, who is also his Creator and Lord. May I be guided by his counsel, and afterwards be received to his glory!

Divine goodness flows in upon us on all hands. What gratitude is due to the great Creator! Let us adopt the words of David, who cried out, when contemplating the works of the Lord, "I will mag-"nify thee, O Lord, my King! I will praise thy "name for ever and ever. Every day will I give thanks unto thee. Bless the Lord, O my soul!

MAY 20.

The fecundity of Plants.

THE magnificence of the terrestrial part of creation, shines in nothing more than in the astonishing fertility of plants. A single one produces millions of others. One stalk of tobacco produces forty thousand three hundred and twenty grains of seed! and if from this we calculate its fecundity for the space of four years, we shall find that it may produce two trillions six hundred and forty-two thousand nine hundred and eight billions, two hundred and ninety-three thousand three hundred and sixty-five millions, seven hundred and sixty thousand grains of seed! An elm of twelve years growth, has often five hundred thousand grains of seed. How would that number be increased in a few years! Suppose the tree had an hundred thousand, and that the shoot of each year contains but five of them, there would be every year five hundred thousand plants which may be viewed as new. If to this we add, what is produced by the increase of the root, by ingrafting and other means, it will appear wonderful that the earth has not yet been consumed by

plants. It must be recollected, however, that a countless multitude of animals derive their nourishment from the vegetable kingdon. When we think of this, we may wonder again that vegetables are not totally destroyed. But whilst animals are destroying them, they are often propagating them, at the same time. While they consume certain kinds of fruit, they scatter seeds about and often to a great distance. This dispersion is necessary, in order that one kind of plants may not occupy a whole field. With the same design some seeds have little wings or feathers, that the wind may carry them about.

Finally, it is certain that plants are more prolific than animals. This may be clearly proved by comparing trees with quadrupeds. The former annually produce, perhaps for several ages, a great number of new trees; whereas the largest animals, such as the mare and the elephant, are often barren, and bring forth only two young ones at the most. Smaller quadrupeds are much more prolific; But their fecundity can by no means be compared with that of trees. Insects and fish come nearest. The tench deposits about ten thousand eggs; the carp twenty thousand, and the cod a million! Now compare that fecundity to the wild-rose, mustard, or fern, and it will be found that those plants, and some others multiply much more than fish or insects; especially if it be considered that most plants multiply several ways, and that animals in general have but one way of propagating. A tree may produce as many new trees as it has boughs, branches or even leaves!

What wisdom shines in the proportion between the animal and vegetable kingdoms! Was the multiplication of vegetables less, a greater number of animals would die of hunger; and our fields and gardens would become deserts. And on the other hand, if the Creator willed that animals which feed on grass and vegetables had multiplied more than plants, the vegetable kingdom must have been presently consumed, and several species of animals have become extinct.

Thus, O man, abundance and pleasure surround thee on every side. It is on thy account that the Creator gives such astonishing fecundity to vegetables: their number cannot be expressed. Faint image of the immensity and omnipotence of the Lord! who, throughout all nature, "opens his "hand, and satisfieth the desires of every living "thing."

MAY 21.

The Beauties of Spring.

NOTHING can be more worthy of admiration, than the revolutions which spring produces on our globe. In autumn, every field, valley, and forest, present us with the image of death; and in winter nature is deprived of all her ornaments. The animals all seem melancholy; the inhabitants of the forest hide themselves, and are silent; the earth appears like a desert, or an universal tomb, and nature seems dull and insensible. But all this while

she silently labours, though we, alas! are ignorant of that secret influence, and that divine virtue, which is making preparations for the renovation of nature. What appeared dead, is again animated, and all things wait for the same revival. What a multitude of changes take place only in the trees! First, the sap, which during winter has forsaken the trunk and the branches, slowly rises up through paths which may be guessed at but not discovered. The sap serves to swell the buds; and what treasures of divine power are inclosed in these small recesses! The leaves, with their smiling green; the branches, which are to shoot through between the unfolded leaves; new buds attached to these branches, and full of invisible leaves; afterwards that multitude of blossoms, with sweet exhalations to embalm the air; fruit in these blossoms; and in this fruit the seeds of an infinite number of other trees. The cheerful light of the sun transports and animates the soul: and the activity of nature in the plants around charms the beholder. Every field presents the eye with an enchanting landscape, and the smell with odoriferous flowers. The birds sing their respective songs: how cheerful is the linnet, hopping from branch to branch, and, extending her voice, flies as if she would draw the attention of man, in order to delight him. The sprightly lark rises in the air, and seems to hail the day, and welcome the spring with her pleasing notes. The cattle, by their various cries, express the joy that animates them. In the rivers, the fish play in the waters, and rise again towards the surface. They have recovered their former vivacity, their agility, and their various

easy and pleasing motions, attract and amuse our sight. Is it possible to behold so often all these objects, and not continually feel the most profound and respectful admiration for that eternal Being, whose power is thus gloriously manifested? Let us never contemplate a tree, crowned with leaves, a field covered with waving corn, an enamelled meadow, a majestic forest; let us never pluck a flower, nor walk in a garden, without recollecting that it is God who covers us with the delightful shade of trees; that it is He who makes the flowers so beautiful, and gives them their perfume; that it is God who clothes the woods and the meadows with their beautiful verdure, so pleasing to the sight; that it is he who gives life and breath to every creature; in whom we now live, and by whose mercy, through Christ, we must be delivered from the wrath to come.

MAY 22.

The Language of Animals.

MAN, properly speaking, is the only animal that can be said to have language; and this marks his superiority over all other animated beings. By means of speech, he extends his empire over all nature; raises himself to his divine Author; contemplates, adores, and obeys him. By this faculty he arrives at self knowledge; at the knowledge of the creatures around him, and renders them subservient to his interests. All other animals are deprived of this faculty, because they are void of rea-

son. It is by our reason that we are enabled to learn languages, and to know the use of speech. But as animals make known their wants and feelings by natural signs, so they utter certain sounds which express the sensations that affect them, they may be allowed to have a sort of language. The number and variety of these sounds, their use, and the order in which they follow one another, form the essential parts of their language. We need not have recourse to deep researches in order to form a just idea of it: our common remarks are sufficient. Let us examine the hen and her chicks. Does she find any food? she calls and invites them to partake of it. They know her voice, and instantly obey. If they lose sight of their tender mother, their plaintive cries express their anxious desire to see her again. Observe the different cries of the cock, either when a dog or a stranger enters the yard, or when a hawk, or some similar bird of prey, presents itself, or when he calls to or answers the hens. What mean those lamentable cries of the turkey? Behold her chicks, all on a sudden concealing themselves, and lying so quiet, that one would think they were dead. The mother looks upwards, and her anxiety is increased; but what does she see? a black point scarcely distinguishable, but which proves to be a bird of prey, which could not escape her vigilance. The bird of prey disappears, and the hen sets up a cry of joy: the young ones revive, and gather happily round their mother.

The language of the dog is so copious, various, and expressive, that it would be almost sufficient of itself to fill a dictionary. Who can be insensible to

the joy that this faithful animal shews at the return of his master: he jumps, dances, and runs here and there, turns with a graceful precipitance round his master, suddenly stops, fixes his eyes upon him with great tenderness, draws near him, licks and caresses him several times. Then beginning his play again, he disappears and returns, dragging something after him; assumes all sorts of pleasing attitudes; barks, and tells every body of his joy. But how very different are these sounds from those noises he makes at the appearance of a robber, or on seeing a beast of prey. The pointer communicates his mind by his motions, and particularly by those of his tail. How well adapted are his signs to the discoveries he wishes to make!

Here again, we may admire the wisdom and goodness of the supreme Being. What kind attention has he shewn towards animals, in giving them the power to express by sounds their wants and feelings. From their organization, and the nature of their minds, it was impossible they should speak the language of man; but they would have been much to be pitied, and less useful to us, had the Creator entirely deprived them of the power of making themselves understood. God has given them proper organs to produce and vary a certain number of sounds; and such is their make, that each has particular and distinct sounds, by which they make themselves understood. In short, the Creator has given such force to the language of animals, as their nature would admit of, and all that was necessary in order for them to answer the end for which they were designed. How great are our advantages, when we are consi-

dered in regard to the gift of speech! We can, through the medium of an infinite number of arbitrary sounds, express all our conceptions; we can know the relation which connects us to other beings, act accordingly, and thus ensure our felicity.

May 22.

The number and greatness of terrestrial Creatures.

Lord, how great and manifold are thy works! The globe how extensive! It is the dwelling place do many nations. Yet though mankind occupy vast dominions, how large a part of the earth is uninhabited: but the seas fill a larger space than the land. And as the earth gives us so great a proof of the Creator's power, so neither can we cast our eyes upon the creatures it contains, without admiring the number and variety of them.

First, we find innumerable kinds of stones, metals, and minerals concealed in the bowels of the earth; and what an astonishing variety of trees, plants, fruits, and vegetables cover its surface. Notwithstanding all the pains that have been taken to observe and class the different sorts of vegetables, it has never been accomplished; nor will all the future efforts of naturalists arrive at it. Let us next consider the living creatures. What a variety between the eagle and the gnat! the whale and the gudgeon! the elephant and the mouse! But though this disproportion is so great, yet the whole space between them

is filled up with living creatures. The animal species approach so near each other, that it is sometimes difficult to distinguish the one from the other; yet so multiplied are the species, that from the gnat to the elephant, they form an extensive chain, each link of which is connected with the preceding. There is no place which does not one way or other contain living creatures. But however astonishing the number of animals visible to the naked eye, they can by no means be compared with the number of those which cannot be seen without a glass. By the assistance of the microscope incredible discoveries have been made. By its assistance a new world, which was before entirely unknown, presents itself to our view. Some living creatures are so extremely minute, as not to be so large as a millionth part of a grain of sand! It is not only their number and variety, but their beauty and the delicacy of their structure which ought to strike us with astonishment. What appears dull to the naked eye, has a peculiar splendour when seen through a glass. Inimitable gilding shines in the smallest grain of sand; but more so in the limbs of certain insects; on the head and in the eyes of a little fly. These considerations should give us a lively sense of our own nothingness. I lose myself in this innumerable multitude of the creatures of God, who would sufficiently manifest his greatness, though millions of such as I had never existed. O Almighty God! how immense is the extent of thy dominions! In all the elements are found creatures who owe their existence and preservation to thee. Every grain of sand is a dwelling for insects, who are also

in the class of thy creatures, and are links of the immeasurable chain. Here my ideas are lost in infinitude. The more I reflect on the greatness and variety of thy works, the more I feel the limits of my own understanding. The number of thy creatures I cannot reckon, nor dare I determine it. All I can do, is to admire and adore.

May 24.

Spring, a picture of the frailty of human Life, and an emblem of Death.

At this season, we need not go far to seek for images of frailty and death. They present themselves to us on all hands; being connected with almost all the beauties of nature. Undoubtedly it was the divine intention in this respect, to remind us of the uncertainty of the things of this world, and repress our natural propensity to place our affections on sensual objects. In the spring, the plants receive a new life; and it is also in the spring that the greater part of them perish. Though the days of spring appear ever so serene, they are often covered with clouds, rain, and tempest. The moon sometimes appears in all the lustre of its charms. Often, before the sun has gained the meridian, the splendour which flattered us with the hope of a fine day disappears. Sometimes also this hope is realized, and the days of spring shine in full beauty. But how soon do these fine days pass away! How rapid is their flight! Before we can well enjoy them, they are gone. Thus it is that the

best of our life flies away. Let us look back on those days of our youth, which may be called the spring of our life. How short-lived have our pleasures been! Where are now those happy moments, those ravishing delights, which we then enjoyed? What is become of our constant cheerfulness, and those roses of youth which ornamented our cheeks; We have now lost all taste for those noisy pleasures which then encompassed us. What then remains of those beautiful days that are fled away? Happy if they had been sanctified by being devoted to our Creator's glory.

How forcibly the spring points out to us the frailty and end of life! How extensive its charms! Behold the trees are covered with blossoms! But we must not exult too much in their appearance; they will shortly return to that dust from whence they came. All that brilliant race of flowers must die in the same spring which gave them birth. Thus does human life vanish away. An unforeseen death hurries us to our graves, though our former health seemed to indicate we might live many years. Sickness and death often come upon us the more suddenly, as their snares are disguised with the charms of youth and health. O ye who are adorned with such charms, the honour of our gardens, the glory of our valleys, how transitory is your beauty! But what an instructive picture for me! I shall soon, perhaps, feel the stroke of that death which I carry in my bosom. The rose lives as it were but a day, and as for me, I may die in an instant!

While we properly enjoy the spring of nature, and the blessings of life, as they are bestowed by the Cre

ator, let us mix serious reflections with these enjoyments. The thoughts of death are very consistent with the enjoyment of every innocent pleasure. Instead of making us melancholy, it should teach us to rejoice in the Lord always, and guard us against making a bad use of earthly pleasures, and inspire us with the desire of solid and eternal felicity. If the visible world possess such charms, what must be the infinite beauties of the invisible? When my life shall fade as the leaf, and wither as the green herb may I say with Christian fortitude, "Although my "life fades like a spring flower, and though those "cheeks, where the roses of youth glowed, shall "become a prey to corruption, I have a hope full "of immortality, and shall possess a body over "which corruption shall have no power." How happy should I be this day, if death should break my chains, and put me in possession of sovereign and everlasting felicity.

May 25.

Spring is an emblem of the Resurrection of the Body.

The flowers which we now so much admire, were not long since coarse and shapeless roots; but they are at present the ornaments of the earth, and the delight of our eyes. What a fine image is this of the righteous, and the state of their re-animated bodies! The human body, while in the grave, is an object of horror; but it shall experience a most astonishing change at the resurrection. "It was

"sown in weakness, but shall be raised in power; "it was sown in dishonour, but shall be raised in "glory." The spring no sooner takes place of winter, but life and joy take place of the melancholy impressions which a severe season makes on the mind of man; and the first fine days cause us to forget the gloom of winter. Thus, at the great day of the resurrection, shall we forget all the sad and gloomy days of our past life. The light of a new creation shall dawn upon us, and all our sorrows shall subside; and God shall wipe away all tears from our eyes.

Spring is the general renovation of the whole earth. However dull it was in winter, it is now no less pleasing and delightful. The surrounding scene charms our imaginations, and we fancy ourselves transported into a new and more joyous dwelling. Thus in the day of the resurrection, we shall find ourselves transported into a new, delightful, and magnificent habitation. In the new heaven and new earth, we shall know nothing of the apparent or real defects which attend the globe we now inhabit. Order, peace, beauty, and righteousness, shall render our future abode the most happy that we can possibly conceive or desire.

When the earth is warmed by the rays of the sun, millions of plants and different sorts of flowers spring out of its bosom. It will be the same in the resurrection; when all generations of men shall rise out of the ground in which they were buried. As the spring flower rises from its seed, full of splendour and beauty, so the body of the Christian, which was deposited in the earth, shall one day arise, encom

passed with glory, and clothed with celestial beauty.

Spring is the epoch of grass, flowers, and plants of all sorts. What is sprung up, daily opens more and more, and becomes more visible. Thus the day of the resurrection shall be to the soul of the Christian, the epoch of the unlimited progress which he shall make in knowledge and happiness. In spring all nature seemed roused from sleep to praise its author, by an universal hymn. Similar songs of joy shall resound in the day of the resurrection from the world of the righteous, who shall be with their Redeemer to behold his glory. With what delight will the soul of the real Christian be filled! We may rise from the less to the greater. If the spring in nature be so rich in enjoyments, what shall be the beauty and happiness of that spring of the new world.

May 26.

On the attractive power of Bodies.

It often happens that two bodies approach each other, without being impelled by any external force. The motion by which this effect is produced, is called gravity, or attraction. This power of attraction appears to be one of the principal springs in nature. By virtue of this law, fluids ascend into capillary tubes, sap rises in plants, and blood and other juices circulate in animals. Certainly the power of expansion in the air contributes its part, at least in plants: for there is a portion of air among the fluid which

nourishes them. Vegetables are also provided with veins, which imbibe the outward air, and at the same time help to draw up the juices; but attraction is doubtless one of the principal causes of this phænomenon. It is generally known that the human body possesses numberless capillary vessels, where the humours are continually in motion; and this motion is regulated partly by the laws of attraction. A great many phænomena which are observed in the corporeal world, have this attractive power for their principle; and it is the most satisfactory way of accounting for the motion of the planets. These enormous bodies, separated from each other at such immense distances, must be united by some secret bond, to form such a grand whole as our solar system: and it is more than probable, that the union of these bodies, their direction, the law which obliges them not to deviate from the course prescribed them, the motion of the comets and planets round the sun, all depend on its attractive influence, and on the gravitation of the bodies which incline towards it. What admirable wisdom is that, which by means of one and the same law, produces the vegetation of a blade of grass, and the motion of the whole system of worlds!

Fall down, my soul, before thy Creator, and adore him! The same wisdom that appears in the celestial bodies, is seen also in the government of rational creatures. In this respect, God acts upon principles equally wise, according to the same laws, and all with the most astonishing simplicity. But by reason of our blindness we are not always sensible of it. Indeed we are apt to overlook what does not

appear strikingly great, in consequence of unreasonable prejudices. When earthquakes swallow up cities and countries, we become attentive; we see then that such revolutions are the works of God, and acknowledge his all-wise providence. But why should we overlook the greatness of God, which is as manifest in a blade of grass, as in the motion and harmony of the spheres! Let us become more attentive to the works of the Lord. Let us particularly remark what relates to ourselves, in which also the divine wisdom so strikingly appears. Our own lives, and the events which mark them, may teach us how wise the means were which God has chosen to make us happy; how many little circumstances his providence has combined to effect this purpose; and what numerous methods he employs to preserve us from evils, and to procure us eternal blessings.

May 27

The complaints of Men relative to certain inconveniences in the Laws of Nature.

"Why is the human body constitutionally subject "to so many infirmities and accidents?" Let him that dares to ask this question, say if he is capable of forming a body that shall unite more advantages than that which he has received from his Creator! It appears inconsistent with the present state of things, that man should be provided with an invulnerable body. Shall we murmur against God, because one of our fellow-creatures is lame, another deformed, and a third deaf? Are those defects so

general as to give us reason to complain? Let the discontented reflect on the following truths. It may be of use to men, to see sometimes what defects human nature is liable to. For when a perfect and well-made person compares himself with one that is deformed, he may see all the advantages of well-formed limbs, and learn better how to value a gift, perhaps but little thought of till then. How valuable are our eyes, and ears, and limbs, and joints, if we consider the condition of the few people who are deprived of them! Would any of us exchange a limb for the greatest treasures? What building, what machine, can equal the human body for beauty and regularity? yet we do not say that the former are the work of chance.

"Why is there such a difference in countries "from one another?" Could the objector form a globe, where all things should contribute to the welfare of men and animals, what plan could he devise more excellent than that on which our world is formed? The countries of the earth, by means of their difference, produce a variety of winds and exhalations, which occasion that mixed air, wherein, as experience tells us, men and animals live healthy and content in most places, and wherein plants also propagate and grow.

"But it is allowed that the variations of the wea-"ther are not advantageous to all men, and to all "countries." But has not the preceding weather influenced the following; as the temperature of one country often influences that of another? Are we able to judge of the whole? Should a million of farmers sigh in vain for rain, because drought

would agree better with the particular arrangement of one house-wife? A partial barrenness may sometimes prevail; but can we call it an evil, if it was necessary to hinder the air from corrupting. Should the east wind when it is favourable to a whole country, cease to blow, because its violence may occasion some shipwrecks, or be hurtful to some consumptive people? If we cannot comprehend the whole ought we to find fault with a part?

"Why are there so many hurtful animals?" Does the objector think it would be better to have no beasts of prey, nor noxious animals, great or small upon the earth? Do they not put a stop to the number of animals that would otherwise overpower us? It is because many animals serve for food for beasts of prey, that their number annually increases. If ravenous beasts did not exist, the dead bodies of animals, on which they feed, instead of being useful would become injurious. Animals thus devoured every year, are replaced by others; and, in most cases, population is regulated by the means of subsistence. Hence gnats and other insects would soon want food, if the animals which feed on them did not prevent them from multiplying too fast.

"Why is the course of nature regulated by such "invariable laws?" It is in consequence of such arrangements that man is enabled, by experience and labour, so to use his understanding and powers, as to be, in some measure, master of his own welfare. Is it desirable to inhabit a world, where, when we were hungry, we had only to wish and we should be satisfied; where our clothes should fall from the clouds, when we neglected to provide any?

Or where we could at pleasure, without using any means, walk sometimes upon land, and sometimes upon water, and sometimes in the air? Where the stomach would never be overloaded with aliments? Where an iron axe should swim, if by accident it fell into the water? Where bodies departing from their natural direction should describe an oblique line, lest by their fall they should injure any body? Would it be desirable to dwell in such a world, where we should not want to do any thing, where we could not in any way promote our own pleasures, where there was neither rule nor fundamental law; where, in a word, the best, the bad, and the worst, being equally unknown, nothing could render us attentive to the laws of nature?

There will, no doubt, always be a number of things in nature, the purposes of which, and the relations they have to the whole, must always remain hidden from us. But at all times let us rest on this principle. "An infinitely wise God does every thing "for the best." And when these enigmas present themselves to us, let us say with the apostle Paul: "O the depth of the riches both of the wisdom and "knowledge of God! How unsearchable are his "judgments, and his ways past finding out," &c.—Rom. xi. 33, 36.

MAY 28.

The Sins which we are prone to commit in Spring.

THE spring appears to be particularly formed to prompt us to the practice of piety. Each field

should appear to us a temple, where we should offer our prayers and praises to our Creator, and where all our actions, thoughts, and words, should tend to his glory. But what daily proofs do we see of man's awful and total depravity? We can view the beauties of nature, without thinking of nature's God; or if we think of him, we forget to return thanks for his boundless goodness. Ingratitude is the prevailing vice of this season, and often the fruitful source of many others.

Man appears to be the only creature on earth who is not sensible of his own happiness, although he alone has the power to reflect upon it, in all its extent. Stupid and ungrateful soul! I now address myself to thee. Yet there is much reason to fear thou wilt not pay proper attention to me, while thou art inattentive to that God who speaks to thee in nature, with a voice so energetic and intelligible. Survey the works of God: every creature reminds thee of its Author. All places are full of the Deity; yet thou hearest, thou seest not.

How dost thou spend those fine days of spring? Quit thy chamber, breathe the balmy air, visit the fields and gardens, and contemplate the beauties of the season; but take care not to abuse it, by giving way to sinful and extravagant pleasures, which draw after them shame and repentance. Thou canst never truly enjoy the spring, till thy attention being fixed on the works of God, thy reason shall discover his divine power and goodness in them. Then shall thy mind have joy and pleasure, which the ungodly are utter strangers to. Why shouldest thou seek those pleasures which wound thy conscience and

offend my God? Mayest thou be led by the Holy Spirit to seek peace with God, through Jesus Christ our Lord!

I would now drop a word to those persons who are apt at this season to be absorbed in anxious cares and fears, lest they should not find sufficient support. O ye of little faith, behold the lilies of the field! Weak and timid souls, be strong in the Lord, and in the power of his might! Put your confidence in him, for spring is the season of hope. When at any time fears glide into your minds, cast your eyes upon the fields and meadows, and remember the words of your blessed Redeemer: "If God "so clothe the grass of the field, if he feed the fowls "of the air, how much more will he nourish you, O "ye of little faith!" Thus while you see others fretful and negligent, let it be a means of exciting you to gratitude and diligence, that you may be distinguished from them by devotion and holiness.

MAY 29.

On the harmony and patriotism of Bees.

UNDOUBTEDLY union and patriotism form the fundamental happiness which in a certain measure is enjoyed by bees. Their republic would soon be destroyed, if they did not live together in a state of union. Those who have communicated their discoveries on this subject, inform us, that when these insects return to their hives, laden with building materials for their cells, some of them are constantly

ready to ease them of their burdens. The travellers begin their journeys again; and while they are gathering more provision, the working bees who remain at home knead together what the others had collected; and thus prepare a mass proper for building. Some are employed in rendering kind offices to the labourers, and bringing them food, that the work may go on without interruption. This harmony nearly resembles the patriotism observable among men. The riches of a nation are those of each citizen; and this numerous republic forms but one family. Here is no self-interest, no avarice, nor rapine. The bees never assemble together to use violence, and to fight against their fellow-citizens. We never see one bee wishing for more than is necessary, while another is in want: nor do they ever strive to acquire more honey, when they have laid up a sufficiency for the winter.

Mean as these insects may appear, we may learn the most happy lessons from them. In whatever condition we may be found, we ought, in the true spirit of patriotism, to act in concert with our fellow-creatures. Christianity and our own happiness require it. Let us bear one another's burdens. Let us even be ready, without thinking it an evil, to make sacrifices to our fellow-creatures, when religion or conscience calls for it. Let us not indulge the vile principle of selfishness: they are contemptible members of society who seek to enrich themselves at the expence of others. Let us do good unto all men, without hope of reward. It is to be lamented, however, that perfect harmony in senti

ments and characters does not prevail. Still, by the wisdom and goodness of God, society is kept up and flourishes.

When a pilot so steers his vessel, as to shun the sand-banks against which the waves would dash him, I admire his skill and experience; and when I see, notwithstanding the wickedness of mankind, in the midst of the storms of passion, that wisdom and virtue still preside, I admire the infinite wisdom of him who governs the world.

MAY 30.

On the prodigious number of Plants on the Earth.

ALTHOUGH above twenty thousand different plants have been found out, yet new ones are daily discovered. By the help of the microscope, some have been found where they were least to be expected. Sponges and mosses have been classed among vegetables, and have presented to the virtuosi seeds and flowers before unknown. Free-stone is sometimes covered with brown and dark spots, and the same is seen on the best polished glass. This mouldy substance sticks to almost every thing; and it is a garden in miniature, a field, or a forest, where plants blossom and produce seed. If we reflect on the quantity of moss that covers even the hardest stones, and the most barren spots; on the quantity of grass and herbs; on the several sorts of flowers; on all the trees and bushes; and add to these the aquatic plants, as slight and delicate as a hair, and most of which are still unknown to us,

we may in some measure form to ourselves an idea of the astonishing number of plants upon our globe.

What appears more wonderful is, that all these different species of plants are preserved, without one destroying the other. To prevent this, God has assigned a place to every species of vegetables, agreeable to its peculiar properties. They are distributed upon the surface of the earth with so much wisdom, that no part is entirely destitute; nor do they grow in too much abundance any where. The nature of some plants requires the shade, others require the middle of a field. The different strata of which the soil is composed, have each their particular vegetables. Nature is no where barren: from the smallest dust to the largest rock, from the torrid to the frigid zone, every soil and climate has its peculiar plants. And it is further to be observed, that these plants used for food or medicine increase much faster than those of less use. Herbs are more numerous than trees and brambles. There is more grass than oaks, which plainly shews, that by this arrangement the Creator has designed the general good.

Omniscient, almighty, and most merciful God! How thy wondrous providence is displayed throughout all nature! A feeble effort of mind may comprehend that thou art great and good. We need only to contemplate thee in the great world of plants.

MAY 31.

The plurality of Worlds.

PERHAPS it is more from self-love and pride than from ignorance, that we call nothing the world but one of the least parts of the universe. We are ready to persuade ourselves, that our globe alone is inhabited; that the sun was made merely to communicate light and heat to it; and that the moon and stars are of no other use but to brighten our nights, and to point out the road to travellers. These ridiculous opinions will be sufficiently confuted by a proper contemplation of the fixed stars. Their twinkling proves that they shine with their own light, and seeing they are visible to us, notwithstanding their immense distances from our earth, the just inference is, that they even surpass the sun himself in magnitude. Is it probable then that these celestial bodies, which are not luminous specks, but great suns, should not have been destined for more excellent ends? If they were only intended as nocturnal lights to us, they would be of no use through the greatest part of the year. The frequent clouded skies, and the short nights, which are seldom dark, would render them useless. Besides, the stars, which from their distance, cannot be seen by the naked eye, would absolutely be of no use; and their destination would be better accomplished by a single star nearer to us, than by so many millions at such a distance. As the same mode of reasoning may be applied to all the uses the stars are of to us, either in navigation or any other purpose, we must

confess that it is impossible for us to see the utility of so many suns, if no creature beyond our globe profited by their light and heat.

A closer attention to the solar system will make this conclusion appear still more reasonable. It has been already observed, that the moon, in many things, resembles the earth: that it has seas, mountains, and valleys, islands, and gulphs. These striking similitudes authorise us to admit others, and to conclude, that in the moon there may be minerals, and vegetables, animals, and rational creatures. From the analogy between the moon and the rest of the planets, we may form the same conjecture of them. And as each fixed star has, according to all appearance, like our sun, its particular planets; so undoubtedly these planets resemble ours. Thus we behold around us countless multitudes of worlds: each of which has its peculiar arrangement, laws, productions, and inhabitants.

How numerous are the works of God! How glorious is the starry sky! How great then must the Creator be! Millions of worlds proclaim his glory. Let all intelligent beings bless his name. I feel inclined, nay constrained, by this view of the starry heavens, to join with the heavenly choir, in singing the praises of the Most High, that it may resound over the whole universe! Perhaps in the future state we shall become acquainted with all these worlds, and be able to comprehend the wonders of them. What astonishing discoveries shall we make! How will the glory of the divine perfections blaze forth! Then shall we see, as we are now seen; and know, even as we are known. May

divine grace fit our souls for the enjoyment of so much happiness. Amen.

JUNE 1.

On the difference between the Works of Nature and those of Art.

WHEN the works of nature are compared with those of art, it is evident that the former have a decided superiority over the latter. This will be evident, if it be considered that the productions of art, are nothing more than imitations of nature. Does not every artist wish to come as near to nature as possible? As he cannot invent, he must submit to be taught by nature. Nature is rich and various; art is dull and poor. We find an inexhaustible treasure in the vast kingdom of nature; and all its parts afford us objects worthy of our admiration, and in which we cannot discover the slightest imperfection. On the contrary, the works of art are soon exhausted; and by a close examination, we may soon find faults and imperfections in them. What is the most perfect statue, in comparison of a single animal, an insect, or a worm. Nature is able of her-self to produce the greatest master-pieces; whereas art borrows from it all that it has of the beautiful, having nothing of its own. Nature has the first right over every thing possessed by art: add to this, that the works of art are far less durable than the works of nature. The works of nature retain their primitive beauty, when the

works of art are demolished. What is the most ingenious machine to the mechanism of an animal. The master-pieces of art are like a child's play-thing, when compared with the productions of nature. Let us only attentively consider ourselves; the perfect and regular construction of our muscles and arteries; the wonderful circulation of blood in our veins; the number and the variety of the motions of our members; and what proofs do they afford of the magnificence of the works of God, in comparison of the most perfect works of man! We might extend these observations; but what has been said is enough to teach us the just value of the works of nature. It is true that our self-love leads us to prefer our own works; and so depraved is our taste, that we look with indifference, or even disdain, on whatever human industry has not produced. But here we give a sad proof of our ignorance and ingratitude. Would it not be very unjust, to set less value on a watch, well finished by the hand of a great artist, than on a snow-ball formed by the hand of a child? This would be a mark of our stupidity and folly. This is exactly our case, when we do not properly distinguish between the works of nature and those of art. We ought not, however, to despise the works of art: they have their value. But let us never prefer them to the works of God. In his all-perfect works we may see, and we should acknowledge his power, wisdom, and goodness. Let us delight in the study of nature, and adore the Creator of all things, and the Redeemer of his people.

JUNE 2.

On the Leaves of Trees.

PERHAPS the leaves of trees are one of the greatest beauties in nature. That we view them as the ornaments of our gardens, fields, and woods, is sufficiently clear, from our impatience to see them bud and unfold. How pleasant to sit beneath their cooling and refreshing shade, in the scorching days of summer! Yet this is one of the least advantages which result from the leaves of trees: they serve more important purposes, as will appear if we consider their wonderful construction. Each leaf contains certain vessels, which being closely compressed at the end of the stalk, extend themselves like ribs on the inside of the leaf, and branch out in a thousand directions. All leaves have extreme fine vessels, and an astonishing number of pores. It has been observed, for instance, that in a kind of box-tree, called palma chereris, there are above an hundred and seventy-two thousand pores on one single side of the leaf. In the open air, leaves turn their upper side towards the sky, and the under towards the earth, or the interior part of the plant. This is in order that they may further the nutrition of the plants. Their pores serve to imbibe humidity from the atmosphere, and to communicate it to the plant. What wisdom appears in this organization! By these means the plant is nourished in dry weather. It is evident from experiments, that plants perspire; and the laws appear to be the principal organs of this important perspiration. They also serve to in-

troduce into the plant all the air it requires. They even contribute to the preservation of the bud which is to shoot the following year: for the eye of the bud is already found under the leaf, and doubtless it is protected and preserved by it. This is the reason that some trees die if their leaves be gathered. Witness the mulberry-tree, whose leaves are taken off to feed silk-worms. This too is the reason that grapes do not ripen, if their leaves be stripped in summer. It may be further remarked, and, which will give us an idea of the plant's growth, that the underside of the leaves is generally of a paler colour, and more rough and spongy than the upper side. This is a wise ordination. The underside being rougher and is consequently more porous; in order to suck so much the better the dew that rises from the ground, and to distribute it afterwards over the rest of the plant in greater abundance. Hence it is also that the leaves of certain plants hang very low. If we observe the trees which grow on a steep hill, we shall find that the leaves do not take a horizontal direction but a perpendicular one; and this shews that they direct themselves to that quarter whence they may receive the most nourishment.

We are thus furnished with another opportunity of admiring the wisdom of the Creator. Let us henceforth consider the leaves of trees in a different point of view to what we have been accustomed to do. Even the smallest object in nature has been planned with consummate wisdom by the Creator. There is not a single leaf useless, or that serves as a mere ornament: they all contribute their share towards the support and fertility of the

vegetable kingdom; and since each leaf is a masterpiece of the power of God, what wonders does a single leaf present to our eyes! It is too much for all the faculties of my soul to comprehend, in the narrow limits of my existence upon earth.

JUNE 3.

On the reviving power of the Sun.

I MYSELF am amongst the millions that feel this vivifying influence. The sun no sooner rises over my head, than serenity and joy are diffused through my soul. Its warmth and splendour inspire me with activity and spirit, sufficient to fulfil the duties of life, and to enjoy society. The involuntary gloom and indolence which rendered me so inactive during winter, are by degrees vanished. I breathe with greater ease, and labour with more pleasure. How can it indeed be otherwise, when I am witness of the universal joy which the sun communicates to the world, and every where perceive its enlivening influence! Shining insects by millions awake, sport and bask in its rays. Birds salute it with their melodious concerts: all that breathe rejoice at its appearance. By its vivifying power, the sap of trees rises, leaves and blossoms appear, and fruit ripens. It sheds life and light throughout all nature. Without its influence, all animals would languish and die. Its influence even extends to the caves and bowels of the earth; where it gives life to animals, and produces metals: it even penetrates into the highest and hardest mountains. Its influence is

darted even to the depths of the ocean, where it acts in various ways. What a miserable condition should we be in, if we were deprived of the light and heat of the sun! The globe would become a lifeless mass, possessing neither order nor beauty. There would be neither leaves on the trees, flowers on the plants, verdure in the meadows, nor harvest in the fields; but an universal gloom would cover all nature.

This is a just picture of the state the earth would be in, were it deprived of the vivifying grace of Christ. Were he not the "Sun of Righteousness, "a Light to lighten the Gentiles, and the Glory of his "people Israel," we should all be buried in the night of ignorance and despair. If his powerful influences do not animate us, how can we bring forth the fruits of righteousness and piety? If Christ had not died for sinners, our condition had been hopeless. No comfort could have been procured from any other quarter. While God is reconciled in Christ, I can contemplate the natural sun with delight; and when I think of my complete salvation, through the righteousness of my Redeemer, I can sing with Paul, "Thanks be to God for his un-"speakable gift!"

June 4.

The desires of the Soul are infinite.

Let this day's reflections be confined to ourselves. Undoubtedly our souls have the first claim to our attention. We should esteem them more precious

than all things else. The observations of outward objects, such as the traveller meets with on the road, are certainly pleasing to him, because he wants recreation and amusement in his pilgrimage; but our observations on spiritual objects lead particularly to that blessed immortality which the true believer expects in the world to come. The desires of the soul are boundless. Our thirst for knowledge can never be fully gratified. As soon as we make one discovery we aim at another; and when we have gratified some ardent wish, we begin again to form new ones. And hence we may conclude, that there must be blessings after death, beyond the narrow limits of this life: that we are not designed for this life only, but for that which shall never end. Indeed it is not probable, that man should be the only creature on earth endowed with faculties, without having, at the same time, the destiny for which these faculties were bestowed upon him. If man had an instinct, without the means of satisfying it, he would in this respect be more miserable than the brutes. When a beast is hungry or dry, it generally finds means to supply its wants. The silk-worm spins its cone, and shuts itself up in it for its transformation; but this would not take place if there were not another state, in which it was to appear in another form. If then our existence was to be confined to time, why should we have received inclinations and desires which cannot be gratified, and faculties which we could never use? Certainly our heavenly Father has not endowed our souls with these infinite desires to no purpose: much less to be a torment to us.

Being of beings! my soul is capable of knowing thee; may I love thee above all things! I would aspire to be like thee. I desire to be raised above every thing terrestrial, and to soar to thyself. Is it possible then that this soul can be annihilated? Were it to be so, I have learnt to know thee in vain. In vain have I aspired after eternal communion with thee: for how short do we fall of this enjoyment below? We know but in part: our love is weak and languid; and our enjoyment of thy grace is still but imperfect. But undoubtedly grace is glory begun; and what we enjoy below is the earnest of our inheritance above. This in a manner explains and reconciles all things; and I see clearly into my future destination. I see now that it is not in vain to wish to advance in wisdom and holiness; and to come nearer and nearer to God, the source, origin, and model of all perfection. I rest assured, that the delightful hours in which the love of God has filled my heart, are not fruitless, nor at an end. I shall attain to endless perfection. All the powers of my soul will be gratified, and employed in a blessed eternity. Let us not then stop at visible, but go on to invisible things. Let us employ the noble faculties of our souls to ascend to heaven: for this end we have received them. Let our affections be "set "on things above, where Christ sitteth at the right "hand of God."

JUNE 5.

On the use of Rivers.

THE space which the rivers occupy, takes up a large part of the land. At this some are discontented; and think it would have been better to have had more land and fewer rivers. But would they consider with what wisdom and proportion the Creator has arranged every thing on our globe, they would conclude that rivers have not been spread over the earth without the wisest intentions towards men and animals. In the first place, their waters afford a very wholesome drink to man. Spring, or pump water, when it has continued a long time under ground, without motion, detaches and carries along with it some particles which may be hurtful. But river water, which is continually evaporating, and always in motion, is purged from all impurities, and becomes, in consequence, the most salubrious drink for men and beasts. But the use of rivers extends farther.—Do we not owe to them the wholesomeness, the neatness, and comfort of our dwellings, as well as the fertility of our fields? The smallest rivulet cools the air around it, and makes it very agreeable; and the neighbouring land is also generally fertile. How great is the difference between a country watered with rivulets, and one that is deprived of them! The one is dry, barren, and desert; the other is a garden of delight. The winding rivulets cause all the difference between the two countries. They carry refreshment, prosperity, and plenty wherever they go. But how subservient are

rivers to trade and commerce! Through the medium of rivers we receive merchandise and necessary provision from the most distant countries. How many machines and mills should we be derpived of if they were not put in motion by rivers? But it is said, "If there were no rivers, we should not be "exposed to such dreadful inundations, which some- "times do so much mischief." Certainly this is an inconvenience; but is is very small and inconsiderable when compared with the advantages which are derived from them. Inundations happen but seldom; and when they do, they extend but little way: besides, these very inundations may be productive of good. They manure and enrich the land; and an attentive observer may see, that while God appears to chastise with one hand he blesses with the other. Thus we see that all parts of nature, and even all the elements, combine to make us happy, and to procure us a thousand blessings. As often as we enjoy these blessings, let us bless the name of the Lord, who is the bestower of all good; and may it be our happiness to "drink of the river "of the water of life freely." Amen.

JUNE 6.

The variety of Flowers.

WE must be struck with astonishment, when we consider the prodigious number of flowers produced in spring, summer, and autumn. But perhaps their variety is more astonishing than their number. If the flowers all resembled each other in their struc-

ture, form and tints, our senses would be fatigued with that uniformity. It is therefore a proof of divine goodness, that the productions of the vegetable kingdom are so pleasantly diversified. This variety does not extend merely to whole families in the kingdom, of plants, but also to individuals. The rose is different from the pink and the tulip, and the tulip from the auricula, and the auricula from the lily; but they have each their own particular character and beauty. There are not two flowers of the same species, in all respects perfectly alike. Survey a bed of flowers in a parterre: some are large, and seem to reign over the rest; some of a middling rank; some carry their stately tops above the heads of men, and others creep upon the ground. Some have the most splendid colours; others are simple, and make no show. Some perfume the air with exquisite odours, whilst others only please the eye with their beautiful colours.

The flowers vary also in respect to their season. In spring, when men leave the city to view the productions of nature, the flowers appear in all their beauty. Towards summer, thousands of flowers present themselves to the sight, and form a most delightful scene. They regularly succeed each other; and in the order designed by the Creator. Winter also produces its plants; which, though they may not please the eye, have nevertheless their peculiar use. If we go over the race of vegetables, we shall find new and greater varieties. What a number of links between the grass which grows amongst the stones, and wheat which affords us such wholesome nourishment, and without which we could not

well live! What a difference between the ivy and the vine whose grapes afford us such delicious drink!

O God! with what wisdom hast thou planned all thy works! This is the most proper inference to draw from these reflections. Both thy wisdom and goodness surpass our comprehension; for they are infinite! May we be plants growing up to maturity in the garden of God!

JUNE 7.

On the use of venomous Plants and Animals.

EVERY thing on earth, separately considered, is wholesome and good; and if any thing becomes noxious, it is because we make a bad use of it, or employ it in a different way to what it was designed. Hence it is, that a sort of food which supports the life of one animal, destroys another; and that the same plant, which in some circumstances is poisonous, in others is very useful and salutary. Hemlock, for example, was formerly thought to be deadly poison; but it appears from many recent experiments, that admirable cures may be effected by it. The variety and number of vegetables which the earth produces is prodigious; but we must not suppose they were all intended for food for men. Some were designed for beasts; others furnish us with ornaments and dress; some please our smell and taste; and a great many of them are medicinal, and would become very useful to men and animals in

many maladies, if they did not mix bad ingredients with them. The same may be observed of many living creatures; which though they be very dangerous to us are very useful to other animals, either as food or medicine. Many birds feed on insects commonly thought hurtful. Domestic fowls eagerly swallow spiders; and peacocks and storks delight in all sorts of snakes. Many medicines are composed of the most poisonous herbs; and the following reflections will convince us that the divine wisdom and goodness are justified in forming creatures which are useful to us in so many ways. The number of noxious plants and animals is small in comparison of those which are of the utmost use to us. God has also planted a natural instinct in men and animals, which gives them a dislike for whatever might be prejudicial to them. Mischievous beasts dread mankind, and seldom interrupt them, unless they are attacked and irritated. And besides, the most noxious animals have evident marks and characteristics, by which their dangerous properties are easily known; that by being warned we may avoid the danger. The rattle-snake, than which there cannot be a more venomous one, gives information of its own approach by the noise made with the rings of its tail. The crocodile is so heavy and awkward in its motion, and turns with such difficulty, that it is very easy to escape it. And it must not be forgotten, as it is another proof of the divine goodness, that the most dangerous and venomous animals furnish the remedy for their own poison. Thus the oil of the scorpion is an infallible remedy for its sting. A bee bruised and

put on the place, cures the evil it did; and the fat of vipers is an excellent remedy against their bite.

But some may still think it would be better if there were neither noxious plants nor animals upon earth. Such objections, however, are only proofs of our ignorance and self-love. There is wisdom and goodness in all God's plans. Some of those creatures which appear hurtful, are not really so; at least in some respects. Their poison, and the organs which they use to inflict wounds, are absolutely necessary for themselves: one example may suffice. Though the bee causes pain by the sting, it becomes useless when the sting is gone. It is the same throughout all nature. Those things which appear hurtful, are absolutely necessary. Is it not presumption then in men to determine what is hurtful or useful in nature? Is it not consistent with the wisdom of God that we should sometimes feel pain? What in itself may be the most disagreeable, may prove to be of the greatest advantage; and it is certain, that "all things shall work toge-
"ther for good to them that love God, and are the
"called according to his purpose.

JUNE 8.

On the perfume of flowers.

I AM on all sides surrounded by a thousand pleasing objects. All things in nature, at this beautiful season, seem combined to fill my soul with the sweetest and purest delight, and to lead my heart towards my Creator. He is the source and giver of all that I

enjoy. Each flower is a proof of his power, the impress of his being, and a hymn to his praise. At present let us confine ourselves to the pleasures which we receive from the agreeable and diversified odour of flowers. Perhaps there is as much variety in the smell of flowers as there is in the flowers themselves. It is true, we cannot exactly determine in what the difference consists; but we perceive it sensibly in going from one flower to another. It is remarkable also, that the smell is not strong enough to hurt the head, or injure the olfactory nerves, nor too weak to prevent its pleasing effects. The particles which emanate from flowers are so exceedingly fine and light, and are so much diffused, that they can produce no inconvenience. One grain will fill a whole room, twenty feet square, and fifteen high, with its perfume. The smell of the rosemary which grows in Provence, is perceived twenty leagues distance at sea.

But whence is it that the vapours which exhale from plants so eagerly reach the organs of smell? It must be partly attributed to the structure of the nose. It is composed of two cavities, separated by a partition; by degrees they unite, and end in only one, which reaches to the bottom of the throat, where there is a communication with the mouth. The whole of this artery is lined with a membrane which is a contexture of nerves. These proceed from the brain, through a bone pierced full of holes, which, for this reason, is called the os cribrosom, or sieve-like bone. The nostrils being wide at the bottom, and gradually contracting towards the top, occasions the smelling corpuscles to accumulate in

the upper part, when we draw the air through the nose, and must of course affect those nerves the more. By these means we receive the impressions of the weakest odours.

The wisdom of God has also formed two bony plates, which stop the upper part of the nose, and have a two-fold use. They prevent any thing hurtful from entering into the breathing-passage during sleep; or when we are unable otherwise to guard it: and they receive and support the ramifications of the olfactory nerves, many of the branches and filaments of which are dispersed over those plates, and the nerves come every where in contact with the odorific particles which enter the nose along with the air.

O God! how much reason have we to bless thee for all thy wise plans! May we diffuse around us the perfume of piety and good works.

June 9.

The multitude of Animals.

Those naturalists who have calculated the number of animals on our earth, have reckoned about four hundred thousand species; and this astonishing number is by no means exaggerated. There is reason to suppose, that in the known parts of the world there are more than four hundred and fifty kind of land animals, six hundred of birds, and more than two thousand of fish with scales; more than three thousand of shell-fish; and more than twenty thousand different species of in-

sects, which may be seen with the naked eye. In this number the insects which belong to the different sorts of animals, and which amount at least to one hundred thousand, are not reckoned. There is besides an infinity of insects yet unknown to us; perhaps above two hundred thousand sorts. How astonishing is the number of insects which feed on plants only!—eighteen thousand species of plants have been reckoned. Suppose then there be but four species of insects to a plant, we shall find the number amount to seventy-two thousand! How will our astonishment increase, if we believe with some naturalists, that every part of the immense kingdom of nature is animated, and filled with living creatures! Very eminent physicians have maintained, that those disorders which are attended with blotches and pimples, and even certain fevers are occasioned by worms. It is very likely that the atmosphere is often peopled with animals, the extreme smallness of which prevents them from being discovered. Who knows whether that trembling motion sometimes seen in the air during summer, may not be produced by millions of insects swarming in the air! Let us take the first flower that falls in our way: a daisy, or a rose, for example, and we shall find a whole republic of insects, whose form and various motions will amuse us. How prolific is nature! She even produces animals in other animals; and has made one animal a world for other creatures to subsist in. The sea appears to be an element made up of animals. The light which is observed on it in the summer nights, is owing to an innumerable multitude of small luminous worms;

the particles of which, being detached from their bodies and corrupted, continue to shine as the animal did when alive. All these innumerable animals of our world are infinitely diversified in their form, their organs, their faculties, and motions. Endeavour, O man, to name all those animals. Express by numbers the individuals only of a single species. Try to calculate how many herrings, flies, worms, and birds there are. How could you do it? Their numbers are unknown; and if they were not, it would be impossible to express them by figures. Here we have a fine subject for admiration. God alone produced, he alone supports, this astonishing multitude of creatures! Let us consider how much food such a number of creatures must require. If they lived only at each other's expense, if they destroyed one another, nature would present us with nothing but a frightful spectacle of carnage and murder. But happily there not many carnivorous animals; and they are very useful in devouring carcases, and by that means guarding us from infection, as well as in preserving a certain balance by preventing any species from multiplying too fast. And besides, the animals have most of them their food assigned in the vegetable kingdom, and are themselves dispersed over all countries. How exactly has the All-wise measured the ground! One tree is larger than some thousands of plants, and yet it occupies only a surface of a few square feet; and a multitude of quadrupeds, birds, and insects find their food there, and lodge in it.

While God is thus displaying his perfections throughout all nature, can the atheist dare to say in

his heart. "There is no God!" Stupid mortal! go and ask the beasts of the field and they shall teach thee, and the fowls of the air and they shall tell thee, that God is; and that he is the rewarder of them that diligently seek him! Speak to the reptiles of the earth, and the fish of the sea; speak to all nature, and it shall declare the existence and sovereign power of God!

JUNE 10.

The immensity of the Firmament.

APPROACH, O man, and contemplate the firmament! Behold the multitude of lamps which shine and illuminate thy nights. Try to count them; but thy weak sight is unable to do it. Thy eyes are lost in the multitude of the stars. Well then, take thy telescope and double thy sight. What dost thou see now? To the former millions, new millions of worlds are added! Endeavour to count the stars thou hast discovered. Thy ideas are confounded: no numbers can express such immense multitudes.

Men have indeed attempted to ascertain the number of the stars; but the attempt is in vain. It is as impossible to number the stars, as to number the grains of sand upon the sea shore. One of the most antient astronomers counted only one thousand and twenty-six stars; but later observations, by means of telescopes, have vastly increased that number, and proved the impossibility of discovering the whole. It is the received opinion, that what is call-

ed the milky way, is composed of a multitude of stars. It is certain, that where we saw with the naked eye only one star, the telescopes have since discovered many more: and it appears, that in two constellations alone, there are twice as many stars as can be seen in the whole heavens with the naked eye. What enlarged ideas, then does this give us of the extent of the heavens! But if the discoveries already made have so increased our admiration of the immensity of the power of God, it will rise still higher, when we reflect how vast a size these bodies must be of, which are many of them visible to the naked eye, notwithstanding their prodigious distance from us. Calculations that may be depended upon for their exactness inform us, that a cannon-ball would require more than fifty thousand years to reach the nearest fixed star!

Some of these globes appear to us larger than others, because they are nearer to us; and on this account they are called stars of the first magnitude; and those nearer to them, stars of the second magnitude. Suppose there were but twenty of these different orders, it would follow that the diameter of the universe would be so great, that a cannon-ball could not pass over it in twenty-four millions of years!

Great King of heaven! Sovereign ruler of the stars! Father of angels, and friend of men! O that my ideas were vast and sublime as the extent of the heavens, that I might meditate upon thy magnificence! O that I could raise them to those innumerable worlds where thy greatness is displayed still more than on this earthly globe! That as I now

walk from flower to flower, I might go from star to star, till I came to the august sanctuary where thou sittest upon the throne of thy glory! But I must first die before these desires can be fulfilled. O that I may die in union with Christ; then shall mortality be swallowed up of life, and I shall know even as I am known!

JUNE 11.

On the singularities of the Vegetable Kingdom.

So great is the variety of animals, that it appears difficult at first view to find any similitude between them and the plants. Some creatures live on water, others on the earth, or in the air; and some are amphibious. But it may be said literally to be the same with vegetables. Some plants live even in the air, some in water, some on earth, and some equally in both. In the island of Japan there is a tree which can bear no moisture; it perisheth as soon as it is watered; and the only way to save it in such a case, is to cut it down to the root, dry it in the sun, and plant it in the dry sandy soil. It is known, that a sort of mushroom, moss, and other small plants, swim in the air. But what is most wonderful, a branch of rosemary which was, according to the custom of some countries, put into the hand of a dead person, took root, and extended its branches to the right and left, that at the end of some years when the grave was opened, it had even covered the whole face of the dead person with its leaves!

The vegetation of the truffle is more singular still. It has neither root, stem, leaves, blossoms, nor even any visible seeds. Its nourishment is drawn through the pores of its rind. But how is it produced? and whence comes it to pass, that there is generally no other kind of herb in the places where this kind of mushroom grows, and that the land is light and full of chinks? These things have never yet been satisfactorily explained. No plant can more properly be compared to amphibious animals, than that sort of moss called nostoch. Its form is irregular, it is a little transparent, and its colour is a pale green. When it is touched it trembles, and is easily broken. After rain, it cannot be immediately seen. This plant may be found at any time of the year; but is most abundant after rain in summer. Its growth is amazingly rapid. It is formed almost in a moment; for when in summer walking in a garden, not a trace of it is seen, if there suddenly comes a shower, and the same place be visited one hour after, the whole walk is nearly covered with it. It was supposed for a long time, that the nostoch fell from the sky; but it is now well known to be nothing but a leaf, which attracts and imbibes a great deal of moisture. This leaf, which appears to have no root, is in its natural state when it is well filled with water. But a few hours wind or sun evaporates the water, and the herb contracts, shrinks, and loses its transparency.

But there are other singularities among vegetables worth our observation. The whole atmosphere is full of seeds and invisible plants, nay even trees, that take root and grow in crevices of rocks, with-

out the least earth. Sometimes vegetation is formed with inconceiveable speed. This is exemplified in mushrooms and common cresses; the seeds of which, if put into wet linen, become a salad in twenty-four hours. Some plants appear to have scarcely any life, and yet they continue to exist. I have often seen willows not only hollow and decayed within but the outward bark so injured that scarcely one-eighth of it remained; yet these trunks throw out new branches every spring. How wonderful is it, that the nutritious juices of plants should not only be furnished by the roots, but also by the leaves, which attract, and in some sort pump in the air; and that there are plants, the tops of which become the roots, and the roots the tops, if inverted when planted! The great age to which trees arrive, is truly astonishing. There are apple-trees which must be above a thousand years old! And if we make a calculation in the gross of the fruit which such a tree annually produces, we must admire the fertility of the pippin, which alone could supply all Europe with trees and fruit of that sort.

But there is no end of such reflections as these: every thing is full of wonders, and should lead us to adore the Creator. Let us look from the creature to the Creator; from the flower to him that made it. On whatever side I look, new wonders strike mine eyes. The fields, the valleys, the mountains, the rivers, and the seas, all, from the atom to the highest sphere, are full of the goodness of the Lord.

JUNE 12.

Means of Happiness found in Nature.

If we consider the intimate connection and relation which subsist between ourselves and natural things, we shall be convinced that every thing in nature tends to the benefit of man. Certainly there may be some things, considered relatively to man, of which we do not see the immediate use: yet we ought not to conclude that they are of no real advantage. Many things that appeared useless to our accestors, do not appear so to us; and perhaps our posterity may discover many things that we are ignorant of. The real use of many creatures may be concealed from us in order to humble our pride, by making us feel the narrow limits of our understandings, and to exercise our minds, and lead us more and more into the contemplation of the works of God. Many things in nature are useful to us, only in an indirect way. Several animals serve as food for mankind; and therefore what tends to support such animals must be useful to us. The larger fish feed on the small ones: many birds feed on insects, and some species live entirely on prey. If the productions of the earth were to feed all animals, there would not be enough left for the use of man, and what then would be the fruit of his labour?

Some creatures indeed, such as venomous serpents, appear to be created to hurt mankind; but if we properly consider this matter, we may even here discover traces of divine wisdom and goodness.

Many excellent medicines are composed chiefly of poison. It is not certain that mankind would have been happier if there had been no venomous creatures in the world. The very poison which they carry, was previously a part of those malignant vapours which men could not have respired without injury. In a word, it may confidently be said, that there is nothing on earth really injurious to man, unless he himself makes an improper use of it.

If God then has thus designed our happiness, ought we not ourselves to aim at the same end? Doubtless we have often lost sight of this end; but let us be wiser for the time to come, and make a better use of the means which are put into our hands. And as we cannot find satisfaction in the creature, let us remember, that godliness with contentment is great gain, and that the peace of God passeth all understanding.

JUNE 13.

On the Loadstone.

THE loadstone is possessed of the most singular properties of all minerals. It is a ferruginous stone of a dark grey colour, and has the virtue of attracting iron. This virtue, however, is not equally diffused through the whole stone, but resides chiefly in its two poles. When this stone is suspended by a thread, and unconfined, it constantly points one of its poles to the north, the other to the south; if first put in motion, and then left to itself. This regular direction, which only varies a little in some

particular parts of the earth, has given the name of the northern pole to that which points to the north, and of southern to its opposite. The properties of the loadstone are communicated to iron, by rubbing it against the loadstone. This discovery introduced the magnetic needle; an instrument essentially necessary to navigators in long voyages. This is a proof that things may become very useful to the world though at first they appear of little importance; and that the knowledge and study of the glorious works of God, are of infinite advantage to the human mind. The loadstone has been further examined, in order to find out the cause of those surprising effects, and with a view of discovering new properties. The examiners have been more successful in the latter than the former. It has been remarked, that the loadstone does not at all times, and in all places, point to the north; but that it varied a little, sometimes to the west, and sometimes to the east. All bodies, iron excepted, give a free passage to the magnetic effluvia; and do not prevent its acting sensibly upon iron. It has been discovered, that the north pole of one loadstone attracts the south pole of another; while the north pole repels the north, and the south pole the south. It was therefore concluded, that the attractive power might be in the iron as well as the loadstone; as they seemed to attract each other equally. To be convinced of this, let a loadstone be suspended at one end of the beam of a balance, and a weight equal to the loadstone be put to the other; and when the beam is in equilibrio and quite motionless, place a piece of iron under it and the load

stone will be immediately attracted by the iron, and descend towards it. If the iron and the stone be interchanged, the stone will attract the iron.—Though these things in the loadstone be very singular, there is another circumstance which merits our attention, viz. that all the efforts, all the sagacity of philosophers have not been able to discover the cause of these amazing effects. The loadstone is still, and perhaps always will be, a mystery to the human mind. Is it any wonder then, that in religion, which is infinitely raised above all the objects of our senses, mysteries should be found which cannot be comprehended here below? Is it surprising that some things in religion should be incomprenensible to us, when in natural things, which we see with our eyes, and feel with our hands, there are found such a variety of objects which the most wise and learned men confess to be beyond the reach of their understadings? There are, however, wise fools, or rather mad people, rash enough to doubt and even to deny, every thing in religion which they cannot comprehend. If this reasoning were just, it would be as proper to say, "The loadstone does "not attract iron, neither does it point towards the "north. All that has been said concerning it is "false; for we can neither explain nor comprehend it."

When natural things are in question, one may say to such persons "Come and see." But the sublime mysteries of religion are only to be seen with the eye of the mind. When admitted into the kingdom of light, we shall understand them perfectly. Let us have patience a while; and if we find in religion or nature any thing obscure and inexplicable, let

us remember that the imperfect state of our souls and bodies, prevents us from searching to the bottom of them. A considerable part of the happiness of the world to come, will no doubt consist in having a more perfect knowledge of all that can tend to contemplate our felicity, and to prove the glorious attributes of the Being of beings. There, in the fountain of light, we shall have a clear and distinct view of all that appeared obscure in this world. May divine grace fit and prepare our souls to enter upon happiness so consummate and everlasting. Amen.

June 14.

On Cherries.

Cherries are a fruit which, from their sweetness, mixed with a pleasing acidity, quench our thirst, allay the fever of the blood in the heat of summer, and prevent many bad humours to which we are very liable at this season. In the first place, by their sharpness they quench thirst, which contracts the glands, cool the parched tongue, and moisten the dry palate. This method of allaying thirst in very hot weather is much to be preferred to all those drinks with which we fill ourselves, and only the more increase our heat and perspiration. But cherries have also a cooling quality, besides this method of quenching the thirst in the most pleasing manner. This cooling quality tempers the heat of the blood, calms the animal spirits, of which the two great impetuosity and agitation affect and weaken the nerves.

Thus the wholesome juice of cherries, by its acidity and astringent virtue, cools us delightfully in excessive heats, prevents the blood from becoming too thin, thickens the fluids, and preserves them from putrefaction.

With what goodness has God provided fruit adapted to the season! We require cooling acid fruits in these hot months, and it is given in abundance. It is so plentiful, that even the poor may enjoy it as well as the rich. Let us think of this when we see a cherry-tree loaded with fruit. How sad would be the condition of the labourer, who must earn his bread by the sweat of his brow, if to refresh himself he required those delicious and expensive beverages reserved for the rich and great, and which it is out of his power to procure! Gracious Lord! thou rememberest the poor; thou providest for their necessities; thou refreshest them with fruits within their reach, and which are as wholesome for them as lemonade and wine for the rich. How plentiful are acid cooling fruits at this season! Our gooseberries, currants, cucumbers, store fruits, and sallads, are so many pleasing preservatives of health.

When we behold the trees, and enjoy the fruits, let us always bless and acknowledge the bounty of Jehovah, and indulge those reflections which naturally spring from the subject. The heavens, the earth, the elements, and every creature, combine to render us happy. We are on all sides encompassed with the blessings of a gracious God. Animals, corn, vegetables, and fruit, in the vale and on the mountain, in the forest and in the seas, all minister

to our pleasure and subsistence. The bountiful hand of the Most High is ever open to us. How great indeed are the blessings which the Creator continually heaps upon us; and how many incitements have we daily to look up to him with unfeigned gratitude, and bless him evermore! May we improve every such occasion. Each time we walk into the country or garden, and whenever we enjoy the beauties and pleasures of nature, let us think of him who is the source of every blessing and enjoyment. And may it be our happiness, in the midst of temporal blessings, to enjoy the favour of that Being who alone can confer eternal life; and may our thirst of knowledge be satisfied from the fountain of life which will fill us with unutterable delight.

JUNE 15.

The wisdom that appears in the construction of the Bodies of Animals.

THE formation of the animal body furnishes the most striking proof of divine wisdom. For, as some animals were intended to dwell chiefly in the air, others on the earth, and others in the waters, it was necessary that their construction should be conformed and appropriated to the place of their residence, and their different modes of existence. We cannot too much admire the wisdom with which the Creator has done this. Every thing is disposed precisely in that way, which the necessities of each animal required; and had any one been formed different to what it is, it

must have suffered considerably by it, and could not have fulfilled so well its respective destination. The birds of prey are provided with strong claws, nails, and sharp hooked bills, that they may catch their prey with the more security and ease. Those who have to seek their food in marshy places, have need of long legs, and a long slender bill; and it was necessary that those which live in the water, should have the lower part of their bodies broad, a long neck, webbed feet, with an oiliness in their feathers to enable them to glide along the more smoothly. Insects that live on prey, have their mouths shaped like nippers; and those that suck their food, are provided with a sting or trunk. Why have hares and rabbits such protuberant eyes, but that they may see the more easily, and the better to avoid the snares and dangers to which they are exposed? Why are the eyes of the mole so sunk and small as scarcely to be visible; but that living, under ground, it does not require much sight; and because full eyes would incommode it, and hinder it from burrowing? Why is the crystalline of the fishes' eye so round but to compensate for the great refraction of the rays of light; whereas animals that live in the air, have their crystalline in a plano-convex form, or like a flatted globe. Why have animals who can move their eyes but two, whilst those whose eyes are stationary have them by thousands? Why is it that animals that seek their prey by night have a very large and brilliant pupil? Why does the eye of the hen answer the double purpose of a telescope and microscope, but that she may be able to see the smallest seeds in the earth, and among the gravel,

and that she may be able to discern birds of prey at a great distance, which are coming to devour her young?

We must be struck with amazement, when we consider the vast apparatus of the organs of animals, in respect to their several motions. What a multitude of limbs! what suppleness! what flexibility! what a profusion of muscles, nerves, and bones, these various motions require! Some animals move slowly, others quickly; some with two feet, others with more; some with wings and feet too, others without either. The different wants of each animal generally regulate the slowness or swiftness of their motion. The more defenceless they are, the swifter they move. Who gave to serpents and other reptiles the power to contract and distend themselves at pleasure; to roll themselves up, and then to dart out from one place to another to sieze their prey? Who gave the fish that particular form, that by means of their air-bladder they can rise and fall in the water at pleasure? Who instructed the snail to contract its body, and bring water into its little dwelling, when it wishes to fall to the ground? What amazing art appears in the formation of birds, in every part of their bodies, and particularly their wings! How well is their body formed for flight! It is small and sharp before, and gradually increasing till it has acquired its proper size, by which means they are well adapted for cutting the air, and making themselves a passage through that element. With what exquisite art are the feathers arranged, and laid one over another in a regular order, to facilitate the motion of the body, and at the same time to serve

for a covering to keep it warm! Though they are close, and strongly braced together, they can spread, rise up, swell, and acquire a large bulk, as necessity may require. The wings, which are indeed the chief instruments of flight, are so placed as to balance the body exactly. What admirable work is there in every feather! The quill is stiff, and hollow towards the bottom; which renders it both strong and light. The beard of feathers is regularly arranged, and narrow on one side, and broad on the other; which is of wonderful use in the progressive motion of birds, as well as in the strong texture of the wings. With what exact proportion are the feathers placed, so as to agree with the length and strength of each feather; and the larger serve as supports for the smaller. In the bony parts of the wings, what a multitude of joints, which shut, open, or move according as it is necessary; either to extend the wings, or draw them close to the body! What wonderful strength in the pectoral muscles, that the bird may pass through the air with the greater rapidity! The tail is constructed with incomparable art; which serves as a helm to direct the flight and assist the bird to ascend or descend in the air, and keep the body properly balanced. In some birds the toes are large, and furnished with membranes, that extend or contract for the purpose of swimming. Others have their claws sharp, and crooked at the points, that they may walk the more firmly, perch at night, and seize and hold their prey. Some have their legs long, that they may walk into the water, and in marshes in search of food: in

others they are shorter; but in all adapted to their necessities and mode of life.

Here the supreme wisdom shines as the meridian sun. Is it possible that things so wonderful, so regular, and so admirably proportioned, can be the work of chance? Can any man in his senses persuade himself that such an innumerable multitude of veins, muscles, bones, and joints, could be put in motion in each animal, and that the most minute parts should stand in so strict a relation to others; and all fulfil their respective functions with such perfect harmony and regularity, and all without design? "Verily there is nothing in existence, if "there be not a God!" Let all things in nature then lead us to glorify Him, in whom we live, move, and have our existence.

JUNE 16.

On the Dew.

THE wise Governor of all things, whose love is everlasting, and who watches continually over his children, and provides for all their wants, makes use of various means for fertilizing the earth. It is sometimes done by inundations; and it is true, that when they lay countries waste, the farmer, who is apt to confine his ideas to the present, gives way to ungrateful murmurs. But in the end, they prove very beneficial. Sometimes it is by a river, which, like the Nile, has the peculiar property of passing its banks at certain periods, and overflowing a country

in which it never rains. Sometimes the earth is watered by rains, which fall more or less frequently, in order to cool the air, and water the parched ground. But the most common means, the surest, and the most universal, though at the same time, that which men attend the least to, and are least sensible of its value, is the dew. This inestimable gift of heaven, which even in years of the greatest drought, keeps the plants from perishing, is seen sparkling in great profusion, each morning and evening on the plants and leaves of trees. The dew does not always fall from above, as was imagined formerly; it does not descend from the highest part of the atmosphere, much less is it the sweat of the stars, as superstition had supposed. This supposed celestial origin, most likely gave rise to the folly of some alchymists, who hoped to convert dew into gold. It is generally allowed now, that the dew is nothing else but the sweat of plants, and the humidity which they attract from the earth. In order to be convinced of this, it will be sufficient to cover a plant with a glass bell; it will appear that the leaves collect in the night, a greater quantity of dew-drops than the leaves of those plants which are exposed to the air. This certainly could not happen if the dew descended and did not rise from the ground. Nor is it difficult to comprehend how it is formed; for it is well known that the rays of the sun, and the heat which is cast on the earth, continually loosen a multitude of particles from off every thing; some of which rise in the atmosphere, and others are collected into the form of drops of water. This origin of the dew, explains why it is sometimes noxious

and a others not. Its nature always depends on the quality of those vapours of which it is composed. The wind carries away the light exhalations as soon as they are formed, and prevents their falling in drops. Hence there is most dew when the air is very calm. By this wise plan of the Creator, plants may vegetate and grow even in those countries where there is no rain; for in those places, the soil being sandy, and consequently very porous and moist below, the heat draws out a great quantity of dew, which supplies the place of rain.

These reflections should remind us of the means which God makes use of to improve the barren hearts of men, and to render them fruitful in good works. Afflictions more or less severe, blessings of every kind, exhortations, warnings given us from the examples of others, and a thousand such means, are made use of by our gracious God, to renew our hearts, to lead us to himself, to sanctify us, and to cause us to bring forth the fruits of righteousness, and true holiness. In nature sometimes a violent storm fall from the clouds, deluges the fields, causes rivers and brooks to overflow their banks, and sweeps every thing away. At other times God calls the soft dew from the earth, and thus, in a manner, grants secretly the wishes of the farmer for rain. Thus also, in grace, he makes use of various means to accomplish his manifold purposes. To some hardened sinners he speaks in thunder and lightning, as formerly on Mount Sinai! Means less terrible are employed to affect and save others; God calls them with a gentle, mild, and persuasive voice to himself. He awakens their consciences

and refreshes their souls with the beneficent dew of his grace. May it please him thus to work upon our minds!

Let this conduct of our gracious God serve as a model for ours. We should employ every means to reclaim our fellow-creatures, to make them better; but let us particularly endeavour to gain them rather by kindness than by punishment. We see how the Lord refreshes the parched earth with dew, he revives and gives new life to the plants. Let us think how many of our fellow creatures are in distress and are languishing in want. Let them not implore our aid in vain; let them not perish for want of assistance. We should rather endeavour to comfort their hearts by kindness, and to pour as many blessings upon them as the dew sheds upon the plants.

JUNE 17.

The Life and Labours of the Bee.

IN the fine days of the present season, those days of joy and gladness, every thing is in motion, and all things in the animal kingdom are full of life and activity; but no creatures appear so full of activity as the little republic of bees. Of all the insects that surround us, there are none we can better be acquainted with, or which can afford us a more pleasing scene.

Bees generally dwell in great multitudes, in hollow trees, or such-like cavities, unless they be put into a hive. They disperse themselves in the neigh-

bourhood of their dwellings; and by means of their trunk collect honey and wax from the juice and stamina of flowers. What they gather they bring to their store-house, which they fill from the top to the bottom in cells, in the form of hexagons. Some of these cells they inhabit; in some they deposit their eggs and lodge their young; and lastly, others are the magazines where they lay up the honey which is to support them during the winter.

Among those bees, which form indeed but one family, there is one larger than the rest, of the female sex, and is, on this account, called the queen. To her alone all the young bees born in the hive are indebted for their existence. Little worms are produced from the eggs which she deposits in the cells: which are clothed with a covering of wax, without any motion, and apparently dead. They are called the nympha while in this inanimate state. When the time is come, they open their cells, and come out in the form of young bees. There are two kinds of bees found in the hive besides the queen, viz. the working bee and the drone. The drones are males; they impregnate the queen, and serve her as her guard. Bees have on their head two horns, which defend their eyes, and give them notice of danger. They have also fangs or claws, which they use in their work; a trunk, or hollow tube, which they can draw in and out of its case as occasion requires. This instrument, being pliant and moveable every way, reaches to the bottom of the cup of flowers whence they collect their honey; which passes through the trunk to the honey-bag within their bodies, which they afterwards empty

into their cells. Bees have six feet. They form their wax of the meal of flowers, into little balls, with the two foremost; and with their middle feet they deposit these balls into spoon-like hollows in their hinder legs, which are also furnished with hair, in order to retain the wax, and prevent it from falling when they are flying. Thus laden with wax and honey, the working bees return to their hives, without ever missing their way, though they sometimes go twelve miles distance. They find other bees when they arrive, which are waiting to assist them to unlade their burdens: and then they all labour together to employ those provisions for the general good. They stop up the crevices of their dwellings with wax, to prevent any other animal from entering; leaving only such openings as are necessary for themselves. The queen and the working bees, have at the extremity of their bodies a sting, inclosed in a sheath, which they use in war with their enemies; but when the sting remains behind, the wound is generally fatal to themselves.

How many things are here to excite our wonder! The formation of their limbs, so remarkably regular, and so well adapted to their mode of life; the care which they take of their young; their activity and industry, are all wonders. Here we may find our Creator. Let us adore his divine perfections, and entreat him to enable us, like the bees, to improve every golden opportunity; that we may lay up for ourselves treasures in the heavens that can never fail, and that where our treasures are our hearts may be also.

June 18.

On the external parts of Plants.

In order to form a proper idea of the exquisite art which appears in the vegetable kingdom, we must proceed by degrees. In consequence of our limited understanding we cannot take in the whole at one view; nor can we ever acquire a perfect knowledge of it here below. A few observations must content us, while we pass from visible to invisible things; from simple to compound objects; and from species to genus. We may then begin by considering their external parts, and stop first at their roots. They are so constructed, that by means of the principal root, fibres, and small roots which grow out of it, the plants are firmly fixed in the earth. The pores of the root serve to imbibe the watery and nutritive juices contained in the earth. The stem proceeds out of the root, to which the plant owes in a great degree its strength and beauty: it has a varied form, according to the nature of the plant. Sometimes it is formed like a pipe, strengthened by knots curiously placed upon it. Sometimes it is so weak that it requires a support, round which it may twine itself, and fasten by means of some little hooks. In other plants the stem rises majestically, like a strong pillar, becomes the ornament of the forests, and seems to defy the winds and the tempests. The branches extend themselves like the arms of the human body, and are very regularly distributed, and covered with boughs. These extend

wider and wider, and divide themselves into small branches, which are arranged collaterally like the large boughs. The buds which come upon the branches are nothing but little plants, which being put into the ground, take root, and become a whole, like that which they were before only a part. The leaves, those enlivening, pleasing ornaments of plants, are placed regularly round the stalks and branches. Each leaf has a different make, out-line, size, and ornament. The leaves are either simple or compound; hairy or fleshy substances; smooth, or indented and curled. The blossoms of trees, whose beautiful enamel forms one of the greatest ornaments of nature, are as much varied as the leaves. Some are plain and have but one flower; others have several. We see a vase gracefully opening here; there we see figures opening in the shape of an helmet, a mouth, a bell, a star, or a sun. Some leaves, or petals, are artlessly placed round the plants; others seem to form spheres and garlands. From the centre of the flower rises a little pillar (often more than one), which is hollow within, round, and sometimes pointed at the top: these are termed pistils. Round these are other smaller pillars, called stamina, and which support the heads. There is also a sort of cases full of a very fine powder.

But who can describe the delicate texture of many of the flowers, the sweetness of their perfume, the sprightliness, variety, and splendour of their colours! Blossoms are succeeded by fruits and seeds, which supply what is necessary for men and animals. In these are contained the germs of

future plants. The external forms of the fruit and seeds vary as much as that of the blossom and leaves, they appear almost in every possible form.

All these parts of plants have their proper use and design. A plant becomes imperfect when it loses the least of its parts: every part is necessary to the whole. Try the experiment, strip a tree of its leaves, and it will soon wither and perish: and it is the same with other plants.

Must we not conclude from these remarks, that the Author of all these beauties must necessarily be infinitely wise? This inference is just and natural; it is self-evident. Let our souls aspire after the enjoyment of the Creator. We may every where trace his footsteps. We may see him in the flowers, and in the smallest blade of grass, if we properly examine it. The more we accustom ourselves to meditate on the works of God, and his wisdom therein displayed, the greater satisfaction we shall find. We may exclaim with transport at the sight of every flower, "How great is our Creator! how wonderful are his works!"

June 19.

A Hymn of thanksgiving for the works of Creation.

To thee, O God, who art the source of all blessings, and who dispersest them with such boundless liberality; to thee belong glory, honour, and thanksgiving. Thou hearest the cry of the young raven,

and art pleased with the hymn of the lark. Deign also to listen to my song, and let the just tribute of my praise be acceptable to thee! The least of thy creatures proclaims thy wisdom. The traces of thy power and goodness are seen from one end of the year to the other; and thou constantly renewest them. Every spire of grass proclaims to me my own meanness, and the majesty of my Creator. With parental tenderness thou providest for my necessities, and givest to all their meat in due season. Thy blessings are constant as the day; and even the wicked feel the effects of thy goodness. Who is like unto thee, O God! Teach me to praise thee in a becoming manner. Incline my heart to love thee, and let me hereafter live to thy glory. In thy name, and in the hope of thy blessing, the farmer sows his corn: thou alone canst give the increase. Though the earth was cursed for our sins, yet thou hast blessed it again, and caused it to yield its increase.

Thou fertilizest the bosom of the earth; thou waterest the furrows of the field; thou adornest the meadows and the valleys, with flowers, trees, and herbage. Thou sendest the dew to revive our fields and gardens, and to shed on them fertility and abundance. The dry and barren soil thou waterest with gentle rains. Thou warmest the cold and damp places with the rays of the sun. Thou governest the seasons with infinite wisdom; so that amidst all the changes of heat and cold, rain and drought, we see the food which thou providest for us spring up, grow, and ripen.

Thou coverest the fields with the most abundant crops, and the wings of the wind support the waving

corn: the tops of the barren rocks thou hast adorned with grapes. Thou dressest our pasture with clover, and at thy command the brooks and the fountains refresh the thirsty animals. Thou causest the tree to take root, and it prospers. Thou causest the life-giving sap to circulate in its stem and branches: thou givest it power to shoot forth buds, leaves, and blossoms; while the abundance of fruit under which the bough bends, proves the pleasure thou hast in doing good.

O come, and give glory to our Creator and Benefactor; bless his adorable name, and celebrate his bounty with transports of joy! Great is our God, and all his works are marvellous! Come and let us exalt his power. The Lord is good. Let the righteous praise him evermore!

JUNE 20.

Caterpillars.

THOUGH these insects are very disagreeable to the lovers of gardens, and very disgusting to the delicate, they nevertheless merit our attention. Caterpillars generally live upon our trees, and we have such a dislike to them, that we destroy all we can find. This may be the reason we cannot condescend to honour them with a look, and still less to examine them with any attention. Yet it is presumed, that even these insects may agreeably amuse an attentive observer of the works of God. Let us adduce a proof. Perhaps by raising the curiosity of those

who have hitherto neglected them, they may be induced not to trample them under their feet; at least not without observing their wonderful formation, and taking occasion from thence to look up to the Creator.

Three hundred species of this animal are already discovered, and yet we are constantly finding new ones. Their shape, their form, their colour, their inclinations and way of life, all seem in some respects to differ. But they have all this in common, that they are composed of many rings, which by dilating and contracting, draw the animal along wherever it wishes to go. Nature has given them two sorts of feet, which have each their particular use. The six fore-feet are kind of hooks, which they use in taking hold and clinging to any object. The bottom of the hinder feet are broad, and armed with little sharp nails. With the hooks they lay hold on the leaves and grass, and other nourishment: and they fix the fore-part of their body with them, while they are drawing up the hind rings. The hinder-feet serve to keep them firm, and to hold whatever they are to rest upon. When on a branch or a leaf they can seize on food at some distance; for by hooking themselves on with their hind-feet, they stand up, raise the fore-part of their body, move it round at pleasure, and poise it in the air on every side, reach their food and take it with their claws. Notwithstanding these advantages which the caterpillar possesses, yet it is remarkable that its state is but transitory; that its limbs last only a certain time, and that by and by this creeping worm will become a chrysalis, without

either feet or motion, till it may be metamorphosed into a creature classing with the inhabitants of the air. This very circumstance alone renders caterpillars worth our attention. At the close of summer, and often sooner, after having satiated themselves with verdure, and after having several times changed their coat, they cease to eat, and begin to build a house, in which they may leave the caterpillar state, and transform themselves into butterflies. This house is called the chrysalis, and is of an oval form; towards the end are rings, which diminish till they end in a point. The chrysalis is full of a sort of milk, which serves for food for the butterfly till it comes out. When it is quite formed, and its parts have acquired a proper consistence, and when a gentle warmth invites them from their prison, they make a passage through the largest end, which is the thinnest part. The head which has been always turned towards that end, disengages itself, the horns lengthen, the feet and wings spread out, and the inhabitant takes wing and flies away. It retains nothing of its first state, but is a very different animal. The caterpillar is often downy, prickly, and of an hideous aspect; but the butterfly is decorated with the most vivid colours. The first was contented with gross nourishment; the latter goes from flower to flower, and roams at large over all nature of which it is itself the ornament.

Ought not this description to reconcile all persons to these insects, and to abolish that hatred which is generally entertained for them? Yet perhaps some may be ready to ask. "Of what use are "these animals? and would it not be better to be

"freed entirely from them?" No; caterpillars are necessary to the perfection of the world. Destroy these insects, and you deprive the birds of a considerable part of their food. As these were to feed on caterpillars, it was just that God should appoint for the food of those, the leaves and the plants, to which they have as great a natural right as we have. It is true, that the voracity of these animals renders them sometimes troublesome to mankind; but this is permitted for wise reasons. It may serve to humble us, and teach us to recollect the uncertainty of our earthly possessions; for caterpillars may sometimes be ministers of God's vengeance. Who can stand against an army of them! We are constantly dependant on the Creator; may we be sensible of it and act accordingly.

JUNE 21.

The beginning of Summer.

SUMMER commences with this day. We have many of us often seen the changes occasioned by this day throughout all nature; but do we know why the sun remains so long above the horizon? why this is the longest day? and why in reckoning from this day to the end of autumn, we perceive the length of the days diminish in the same proportion? The earth's annual motion round the sun, is the cause of all these changes. When the sun enters into the sign Cancer, the earth is so situated, that all its northern side is turned to

wards the sun; because the axis of our globe is inclined towards the north, which direction it invariably preserves. On this inclination, and the parellelism of the axis of the earth, properly speaking, depend the four seasons of the year. Here we ought for a moment to reflect on the wisdom and goodness of God, manifested in this inclination of the the axis of the earth. Had the direction been perpendicular, the earth would be a melancholy abode for animals and plants. The days would all be of equal length; nor would there be any change in the seasons. How deplorable then would be the condition of the inhabitants of the north! The air we should respire would always be as keen as in March or September; and the soil would produce little else but moss and grass. In a word, the greatest part of our hemisphere would be but a dreary desert, the habitation only of a few insects.

In our climate, nature has at this time nearly finished her annual work. Already she has lost a part of her beauty and variety. Though nothing can be more green than the vines and orchards, yet the shades are not so pleasing. The verdure of the meadows begins to fade, and their flowers are mowed down. By degrees the corn grows insensibly yellow, and the number of the flowers diminishes. Not long since, the various notes of a multitude of birds had all the charms of novelty, and cheered us in the most delightful manner; but now as autumn approaches, these enjoyments diminish. The nightingale is silent, and the great heat renders walking inconvenient. Are we not here furnished with an emblem of life? Are not the pleasures we enjoy

equally transient? The most innocent and pleasing scenes change, and give place to other objects. What we now observe in the summer of nature, may also be seen in the summer of life. When we have attained our fortieth year, which is the meridian of life, the world loses part of its charms, especially those which delighted us in youth: and as the autumn of life advances, we often become a prey to many cares and anxieties; and are less sprightly, calm, and happy, than we formerly were. Bodily strength insensibly wears away with age. In fine, the days arrive when we are ready to say, "We have no pleasure in them."

But with what heartfelt joy may we lift up our minds to thee, Parent of the universe, who directest the seasons, and art the Fountain of felicity! Grant that I may never forget thee in the midst of the many blessings which I enjoy! I bless thee for the summer, and more especially as it may be the last summer which I shall ever see upon earth. Alas! what thousands of mankind, and many of our friends and acquaintances are gone into the eternal world since the last summer! Perhaps we may be soon called to rejoin them. Possibly this may be the last time we shall ever behold the beauties of nature. Let us therefore enjoy this summer, as if it were to be our last. May our lives be such, that we may never have cause to regret that we have seen so many returns of the season. O God deign to confirm us in these resolutions, by thy holy Spirit, and give us power to reduce them to practice! Amen.

June 22.

On the Nightingale.

The charming nightingale is a musician of the first rank amongst the inhabitants of the air. When all the songsters of the grove are silent, then the nightingale tunes her voice to animate and cheer our minds. While we listen to the sound of her voice, we are ready to think that the bird must be large, and of great strength; and the inimitable charms of her melodious accents make us presume that she surpasses all other birds in beauty.

But these perfections are sought for in vain in the nightingale; she is a bird of mean appearance; the colour, form, and whole exterior of which have nothing majestic or attractive. However to compensate for her plainness, nature has given her a voice, the charms of which are irresistible.—Hearken to her fine long quavering notes; what richness, variety, sweetness, and elegance! When she commences singing, she seems to have studied beforehand the melodious accents which she is going to pour forth. She begins softly, then the notes gradually swell, till they run with the rapidity of a torrent. She proceeds from grave to sprightly notes; from simple sounds to the wildest warblings; from the lightest turns and quavers to languishing sighs; and has throughout, the whole art of pleasing the ear.

This bird may give rise to many useful and edifying reflections. We may learn, for instance, that homeliness of body is sometimes united with the

most amiable qualities and mental beauty. How unjust then are those, who only attaching themselves to the beauties of the face, and to outward qualities, praise or blame nothing but what strike their senses; and despise those who have bodily defects. Let us learn to think more rationally: for a man deprived of the advantages of figure and fortune, may manifest in his conduct a wise and holy mind, and thus become worthy of universal esteem. "The soul is "the standard of the man!" Have we not seen persons who were neither distinguished by birth or fortune, become the most useful members of society, and render important services to their country? Crooked and deformed people have often, like the aposlte Paul, shewn more greatness of soul than others possessed of the most beautiful person and finest form. We must not trust to appearances; those we despise may often be found to be superior to ourselves.

The harmony of the nightingale should lead us to that God, from whom she received the gift of singing so sweetly. There must be the greatest wisdom in the formation of this bird, which makes it capable of such sounds. Lungs so delicate as those of the nightingale, the motions of which are so violent must be easily hurt, if they had not the singular advantage of being attached to the back-bone by a number of little sinews. The orifice of the windpipe is very large. and certainly that circumstance must contribute much to the variety of its notes; which while they charm the ear, may fill the soul with sweet and pious delight. Let the song of

the nightingale lead us to glorify the Author of all nature.

Amiable songstress! teach me to celebrate thy Creator and mine! May thy songs awaken the most insensible mortals, and excite them to praise that God whose mercy is everlasting, and whose truth endures to all generations!

JUNE 23.

The pleasure which Summer affords to our Senses.

SUMMER has inexpressible charms, and gives us daily proofs of the infinite goodness of the Creator. In this happy season, God pours out the treasures of his bounty in the most abundant manner on every living creature. Nature having revived us with the pleasure of spring, is now constantly employed in providing for us every thing to please our senses, to make our subsistence easy, and to awaken in our hearts a lively sense of the Creator's goodness.

By virtue of the secret laws of nature, an innumerable quantity of fruits grow before our eyes in the fields and gardens; fruits which not only serve to please the sight, but may be afterwards gathered and preserved for our food. What pleasing variety in flowers! we admire their rich dress, and the astonishing fertility of nature in the multiplicity of their species! What variety is there in the plants, from the humble moss to the stately oak! There are still new charms as we pass from flower to flower.

JUNE.

"What pleasing variety in flowers, &c." Sea piece, pl.

Published [illegible]

Let us climb the loftiest mountain, seek the cool shade of the woods, or descend into the valleys, we shall every where find new beauties. A multitude of objects present themselves to our eyes, all different from each other; and yet all possess beauty sufficient to engage our attention, Innumerable flowers here; divers kinds of living creatures there. The celestial azure delights the eyes, if we look upwards; and if we look downwards they are refreshed with the beautiful verdure with which the earth is covered. Our ear is charmed with the cheerful notes of the winged songsters: the simplicity and variety of this melody create the most deilghtful sensations in the soul. The murmuring of the brooks, and the silver waves of a fine flowing river, please both the eye and the ear. To indulge our taste, the strawberries, and other pleasant fruits, ripen; while at the same time they cool the blood. The new productions of the fields fill our barns and granaries, which not only please our taste, but afford us the most wholesome nourishment. Sweet emanations from all quarters strike the smell. In a word, a thousand agreeable objects affect the senses, and raise our sensibility. Numerous flocks feed on the profusion of bountiful nature, and digest wholesome herbs, to procure us the healthful milk and the nourishing flesh-meats. Abundant rains moisten the grounds, and open to us new sources of blessings. The trees and groves afford us the most delightful shade. All that we hear and see, all that smell and taste can convey, increase our pleasures, and contribute to our happiness.

But while my attention seems to be fixed on earthly

objects, my thoughts soar upwards insensibly to heaven, and are lost in the abyss of eternity. O heavenly joy! can there be any pleasure on earth for which I would exchange thee? Is there any thing that equals thy worth? Well, a few summers more at most, perhaps a few days, will put a period to all my cares, and to my existence below. Where my exalted Lord is, there shall I also be, as a trophy of redeeming mercy. What thanks do I owe to thee, O my blessed Redeemer, for such sublime hopes!

JUNE 24.

On the inward parts of the Human Body.

THE more difficult it is to acquire a proper knowledge of the internal parts of the human body, the more needful it is to make use of the information with which we are furnished by the most skilful anatomists. With this design, I am now going to present the reader with a short description of those parts.

The heart, placed in the thorax, or breast, may be called the spring of motion to the whole machine; and is highly worthy of our admiration. This viscus consists of muscular fibres, curiously interwoven. Two cavities, called ventricles, are formed in the inside of this organ: they are separated by a partition. As the heart continually dilates and contracts, and expels from the lungs the air received through the nose and mouth, it is by means of it that respiration is carried on.

The lungs are a spungy substance, which, like bellows, open and shut, to take in and expel the air. They extend on both sides, and nearly fill up the whole cavity of the breast; to refresh it with the air they draw in, and at the same time to prevent the blood from being too much attenuated. The breast is covered on both sides with a fine thin membrane, called the pleura. Under the lungs, the stomach is situated; which receives and digests the food: it is in shape like a purse. On the right side is the liver, which covers one side of the stomach; and by its heat assists digestion. By means of the liver the bile is separated from the blood; which is collected in a small vessel, called the gall-bladder. This liquor descends into the intestines; and the irritation which it causes in them, helps to expel the excrements. The spleen is opposite to the liver; it is a soft body, and easily stretched. The blood passes into it by the arteries, and flows out of it by the veins. The kidneys, or reins, are behind the liver and spleen: these are two in number, one on the right and the other on the left. They are designed to separate from the mass of blood, the humours which pass into the bladder. Beneath these parts are placed the intestines, which are attached to the mesentery. They complete the separation of the digested food, and expel from the body what is unfit for nutriment. The mesentery is a great membrane, which folds several times over, and forces the intestines to fold themselves in the same manner: innumerable vessels, as fine as hair, are seen in the mesentery: they are termed milk-veins, because they contain a juice resembling milk.

In the middle of the mesentery is a large gland, where the lacteal veins unite as in a common centre. All the intestines are covered with a skin full of folds, glands, and muscles. All that part of the body called the abdomen, which begins at the stomach, is separated from the breast by the midriff, or diaphragm. It has several openings, to give passage to the vessels which are to descend to the inferior parts: to it are fastened the liver and spleen. An agitation of this membrane occasions laughter: it also helps to disengage the spleen from the humours which incommode it.

These are the principal parts of the thorax and abdomen; but there are several others which communicate with them. At the beginning of the neck is the wind-pipe and the osophagus (gullet). The food passes into the stomach through the osophagus. By the wind-pipe the air passes into the lungs. When the lungs send back the air through this channel, the voice is formed; and the breast, at the same time throws off its superfluous humours. A small valve, or covering, is placed at the top of the wind-pipe, which opens and gives passage to whatever is to pass through that pipe. The lower orifice of the stomach is provided with a similar cover, which opens when the food presses upon it, and then closes, to prevent its rising up again. The brain is placed in the upper part of the head. It is capable of receiving impressions from exterior objects. Its whole mass is covered with two fine transparent membranes: the outward one is called the dura mater, and the inner pia mater. Independent of those parts, each of which occupies a d ter-

minate space, there are others which are scattered over the whole body; such as the bones, arteries, and veins. The bones, set in their joints, partly serve to support and give the power of motion to the body, and partly to guard and preserve its noble parts. The arteries and veins are diffused through the whole body, to nourish it by the blood which circulates in them. There are likewise many lymphatic vessels, which generally join to certain glands, and receive a yellow and transparent liquor, which they afterwards distribute to the whole body. The nerves, of which they reckon ten principal pair, are small fibres springing from the brain, and from thence are spread over the whole body, even to the very extremities of it. Some think they are hollow, and contain a sort of medullary substance, like that of the brain. They are the organs of sense and motion to the whole machine. All these parts are pierced with holes, in order that the light and subtle matter, which superabounds, may transpire. They are, in consequence of their extreme fineness, invisible to the naked eye, and are called pores. Indeed the most astonishing art, and the most profound wisdom, are discovered in every part of the human body, internal and external.

To sum up the whole, we may observe, that the bones, by their solidity and their joints, form the foundation of this fine machine. The ligaments are cords which fasten all together; the muscles are fleshy substances, and which act as elastic springs; the nerves establish the most intimate connection between all the parts. The arteries and veins, like rivers, convey life and health to every part. The

heart, from its central situation, is the focus, or the acting power, by means of which the blood circulates, and is preserved. The lungs draw in the outward air, and expel the hurtful vapours. The stomach and intestines are the magazines where those matters are prepared which are necessary for daily supply. The brain, which is most likely the seat of the soul, is formed in a manner suited to the dignity of its inhabitant. The senses, which are the soul's ministers, warn it of all that is necessary, either for its pleasure or use.

Surely I may say with David, "I am fearfully and "wonderfully made!" May I often think of these things; and as often feel my whole soul to overflow with unfeigned gratitude and love to my great Creator!

JUNE 25.

The Electric Fire.

THE existence of electric fire is now generally allowed; and its singular effects have engaged the attention of all Europe for more than fifty years past. It appears that this fire is equally distributed through all bodies; but like the air, it is not apparent to our senses till it is put in motion; and the balance which has been interrupted by any cause whatever, must be restored before we can perceive the electrical fire. In this case, two different sorts of bodies must be marked or distinguished. The one sort are such by nature, that the electric fire can be pro-

duced in them, and increased by means of friction. The others receive their electrical force by communicating with the first: those of the former class, are pitch, rosin, sealing-wax, hair, silk, and air. All other bodies, especially water and metallic substances, belong to the second. The bodies of the first kind, are capable of preserving the electric matter which is collected in them. On the contrary, those of the second lose it as fast as they receive it.

Machines have been invented, in which, by means of a wheel, a rapid motion is given to a glass globe, which, as it runs round, rubs against the head of a cushion. The globe preserves its electric virtue by means of this friction; and this virtue may at pleasure be extended, by wires or chains, which communicate with the glass globe. When the machine is working, if the hand be put to one of these wires a smart shock is felt; and if the room be darkened, a bright spark will be seen. If any number of persons take hands and form a circle, they will receive the shock at the same instant; and its force may be made more or less violent at pleasure. Indeed it is possible to give sufficient force to the electric fire, to kill not only small birds, but hens, geese, and even sheep. This experiment takes place by means of large glass bottles filled with water, and fastened together by metallic chains, and in communication with the glass globe, working as before described. The water communicates to the internal surface of the bottles a large quantity of the electric matter; while the outward surface loses an equal quantity of it, by means of its communication with some con

ducting body. A violent flash, a loud explosion, and violent agitation, ignition of cumbustible matter, and the instant death of the animal, are the consequences of this experiment.

There are also other effects, which are common to all kinds of experiments; such, for instance, as a sulphureous smell, an agitation of the air, and the electric fluid acquiring a new property. It has been observed indeed, that some experiments have failed, because the wires, which served as conductors, were too angular and pointed. And then it has been supposed that the electricity lost its force by the points; and this supposition was confirmed, by putting the hand or face near the points and angles; from whence a copious stream of the electric fluid was perceived to issue. Then it was thought possible, that those points which ejected electric matter, might also serve to attract it; which conclusion has been proved true by many experiments.

If any should think these experiments are of no use, I would endeavour to undeceive him. A twofold use has already been discovered, and time may find out more. The faculty have applied electricity to their art; and there have been instances of paralytic limbs being cured by electric shocks. Naturalists have also discovered a great analogy between electric fire and lightning; which has given rise to new opinions respecting the manner in which the thunder is formed, and has completely changed the former ideas on that subject.

Thus we are daily receiving new solutions of the mysteries contained in the great works of the Cre-

ator. How circumscribed are the views of men! and how little attention is paid to those important things which are placed before our eyes; seeing the above phænomena have lain hid for so many ages! How little do we know of nature, and how much have we still to learn!

JUNE 26.

On the manner in which Thunder is formed.

IT was commonly supposed, even at the beginning of the eighteenth century, that thunder proceeded from an inflammation of salts, and other substances which are found in the air. It was thought that there was a very great resemblance between the effect of fire-arms and that of thunder and lightning but this system was clogged with difficulties which could not be solved. But since proper attention has been paid to the phænomena produced by the electric fluid, we are authorised in ascribing the same cause to each. The perfect resemblance between that and electricity, has convinced the naturalists that they are the same; and that electricity is in our hands, what thunder is in the hands of the Creator. He executes in the great what we imitate in the little. This is easily to be demonstrated, even to those who are unacquainted with natural philosophy if they will so far trouble themselves as to compare the effects produced by thunder with those produced by the electric fire.

The effects of thunder appear by a loud noise heard at a distance, and by conflagration. Build

ings that are struck by it are set on fire, and often consumed. Men struck by it become livid, and appear scorched; though frequently there is no trace of the fire. Men are often killed merely by the violence of the blow; their clothes are all torn to rags; the lightning throws them to some distance from the place in which they are struck, and frequently that part of the body where the lightning fell is pierced with holes. Sometimes it breaks the hardest stones; and its ravages are easily discovered on the ground where it falls.

The same effects are produced by the electric fluid, only in a less degree. When by means of water its power is increased, the electric flash is followed by a very sensible commotion. The most compact bodies are perforated, birds and small animals are killed: and every flash is accompanied with a noise. The torrents also of fire, which fly off hissing from the points of electrified bodies, is one of the phænomena which are found in lightning: and in regard to its swiftness, the resemblance is still greater. If during a thunder-storm, a chain, or sword, be hung in the air by means of silken cords, it becomes electrical. If a finger be put near it, there will proceed out of it sparks of fire; the strength of which will be proportioned to the storm, and the distance from the electric cloud. In fine, every effect of electricity appears during a thunder-storm. It is clear from these remarks, that the air is then highly electrified, and that the thunder and lightning are the mere effects of a violent electric shock.

Thus all that appeared tremendous and wonder-

ful in these natural phænomena disappear by degrees, as we improve in our knowledge of the laws of nature. Hence it is highly desireable, that every one should have at least a general knowledge of the first principles of natural history. If we reflected more on nature, or conversed more with those that are properly acquainted with the subject, it would tend to annihilate our fear and superstition; which are so apt to mingle themselves with our observations of nature. Let the light we have be a mean of banishing that distress and fear which seize on our minds at the approach of a thunder-storm: and in future, let us look up to, and trust in that God who performs such great marvels. For though we can thus assign the cause of thunder, it is not therefore the less wonderful. There are certain circumstances in this phænomenon which will always be inexplicable, even to the most enlightened genius. It may suffice us to know, that the nature of the air, and the whole surrounding atmosphere, render thunder necessary; that these storms, in the hand of God, are a mean of fertilizing the earth; and that therefore they should excite us to pay a tribute of adoration and gratitude to our great Creator.

JUNE 27.

On Herrings.

IT may not be amiss to examine what is important in the natural history of herrings. Innumerable shoals of them live in the frozen sea, near the arctic

pole; but they quit that place at a certain period, and come in multitudes to the coasts of England and Scotland. The real cause of their emigration is not yet positively ascertained. Some think it may be to avoid whales, and other great fish, in the frozen seas; others suppose, that the prodigious increase of the herrings obliges them to take these long voyages, and to divide into separate colonies, lest they should be in too great quantities to find sufficient food in the northern seas. Probably it is the desire of propagating, and a particular instinct, which leads them to places more favourable for the increase and support of their species. It is certainly some of these reasons, or all of them combined, that induce vast shoals of herrings to leave the North at the beginning of the year; for by March or April the western wing of this immense army reaches the coasts of Iceland. At this season herrings are so plentiful about that island, that they take up great quantities of them at once with a shovel with which they water their sails. The eastern wing advances further into the Baltic sea. A part of it turns towards the North Cape, comes down the coasts of Norway, and enters the sea by the Sound. Another part gains the northern point of Jutland: then enters into the Zuyder Zee, whence it proceeds into the Baltic, in order to return to its former residence. But the most numerous detachment of the eastern wing, is that which turns to the western coast and arrive at the Orkneys, where the Dutch go to catch them. About the eighth of June, that part of the sea is full of herrings: afterward they turn towards England and Scotland, where they

fill all the bays and harbours with their fry. Having quitted England, they probably return northward to their own country: at least they then disappear, and we know not what becomes of them.

How prodigious is the number of these fish! A single female herring deposits in the sea, near to Great Britain, at the least ten thousand eggs. This astonishing fecundity renders credible what is said of the Dutch fishery; who take annually about two hundred millions of herrings. From this fishery vast numbers of persons are supported; and the Dutch revenue gains a sum of more than two millions of dollars.

How proper for us to lift up our hearts to the almighty and infinitely bountiful Creator, who by a guidance full of wisdom, causes the fish to fall into the nets and hands of men. By how many different ways he provides for our support! Every sea, lake, and river is tributary to mankind, and yields something towards their support. While we thus feast on the bounty of the Creator, may we maintain a grateful sense of his goodness, and devote our lives to his praise and glory.

JUNE 28.

On the Eclipses of the Sun and Moon.

THE ignorance that prevails (not only among the common people, but among those also who pretend to superior knowledge) respecting these phænomena, is a disgrace to this enlightened age. Hence pro

ceeds those superstitious notions relative to eclipses of the sun and moon. If people would be at the trouble to examine the cause of them, they would at once be convinced how ridiculous it is to shut up wells, lest the water should acquire any noxious qualities; and to use other superstitious precautions, which are lamentable proofs of ignorance among men. Let us then endeavour to acquaint ourselves with this phænomenon; and the more so, because it is in itself remarkable, and tends to display the glory of the Creator. The eclipse of the sun is an effect entirely natural. It is caused by the moon passing between it and the earth; but it cannot take place except when the moon, which is itself an opaque body, comes nearly in a direct line between the sun and our earth. Then it conceals a part, or the whole of the sun; the last is termed a total, the first only a partial eclipse. Thus the solar eclipse is nothing more than the situation of the earth, when the moon's shadow falls upon it; and it ought rather to be termed an eclipse of the earth.

We must not think, that in this case the sun is really darkened; it is only a partial concealment of its rays. The sun still preserves its splendour, and all the change that takes place is, that the rays which proceed from it are prevented from reaching the earth by the body of the moon, which is then between the sun and the earth. This is the reason that an eclipse of the sun is never visible in all parts of the earth; for unless the sun had really lost its light the eclipse could not be at the same time in every part of the hemisphere. On the contrary, it

is always more in one country than another; and there are places where it is not visible at all.

The moon not only darkens the earth at certain times, but the earth also casts its shadow upon the moon, and by that means intercepts the rays of the sun from it, either wholly or in part; and this is called an eclipse of the moon. But this can only be when the moon is at one side of the earth, and the sun at the opposite side; and consequently when it is a full moon. And as this planet is really darkened by the shadow of the earth, the eclipse is seen at the same time from every part of one hemisphere of our globe. Should the reader ask, of what use are eclipses?—Certainly they are of great importance. It is by their means we can determine the true situation of cities and countries, and trace with the greatest exactness maps of the most remote countries. Eclipses, properly observed, tend to confirm chronology, and direct the navigator, by shewing his longitudinal distances east and west.

When we see an eclipse of the sun and moon, let us think of the great events which shall take place at the last day! What terror shall then seize the minds of men, and especially of unbelieving sinners; when they shall behold the sun darkened, and the moon lose her light; when the elements shall melt with fervent heat, and the heavens pass away with a great noise, 2 Pet. iii. 10. O may we then enter into that world were there is no need of the sun, nor of the moon, but where the Lord shall be our everlasting light, and our God our glory! Amen.

JUNE 29.

The Stalk of the Wheat.

NATURE is making continual progress. We see the wheat springing up daily, and the tender ear insensibly ripening, in order that we may in a few weeks be furnished with nourishing bread, that precious gift of heaven. Let us view a field of wheat, and endeavour to calculate the millions of ears of corn which cover it, and reflect on the wisdom of those laws which afford us such an abundance. How many preparatives were necessary to furnish us with this most indispensable of all food! How many progressive changes must take place in nature before an ear of corn can spring up. At present it is ready to produce its fruit, and invites us to reflect on its construction.

When a grain of wheat has been some time in the ground, it shoots up a stalk, which rises perpendicularly; but its growth is very gradual, that the grain may have time to ripen. It attains the height of four or five feet, in order that it may be preserved from the humidity of the ground, which would otherwise rot it. The height of the stalk contribute also to refine its nutritious juices, which are drawn from the roots: and its round form favours this operation; for by this means the heat penetrates every part of the stem. But how can so delicate a stem support itself? will it not sink under its own weight, and be beaten down with the least blast of wind?

That God that formed the stalk, took care to

prevent all these inconveniences. It is furnished with four very strong knots, which serve as screws to keep it tight, without preventing its pliability. The construction of these knots display the greatest wisdom : they are full of little holes, like a fine sieve; by which means the sap arises, and the heat penetrates. The juices which collect there, are attenuated and purified by the heat, and so forced through this fine strainer. The stalk is liable of being beaten down by storms and heavy showers; but its slenderness is its security; and it is flexible enough to bend without breaking. Were it harder and stiffer, it might certainly resist all such attacks, but it would not then be so useful for cattle, nor serve as a bed for the poor.

By the sides of the principal stem, others spring up not so tall; whose leaves, collecting the drops of rain and dew, supply the plant with those nutritious juices which are necessary for it. Meanwhile the ear, the essential part of the plant, is gradually formed. To preserve these tender sprouts from the dangers they are exposed to, the two upper leaves of the stalks unite closely; which at the same time tend to furnish them with the necessary juices. But as soon as the stem is sufficiently formed to supply the grain of itself with the necessary juices, the leaves gradually dry and drop off; that nothing may be taken from the grain, and that the root may have nothing to nourish that is useless. When this scaffolding is removed, the building shews itself to advantage in its own beauty; the corn waves gracefully, and its beard serves both for ornament and for a defence against the birds. Supplied with refreshing showers, it

flourishes till the appointed time, gives the farmer the most pleasing hopes, ripens day by day, till at last, bowing under the weight of its riches, its head falls under the sickle.

What divine wisdom and power are displayed in this part of the works of God! Yet how apt are we to be inattentive to it, because it is continually before our eyes; but if we be unaffected with this proof of the Creator's goodness, what additional proof can we look for? Insensible, ungrateful man! open thy heart to the sweet sensations of grateful joy! If thou canst view a field of corn with indifference, thou art unworthy of the bread which it so abundantly furnishes. Shake off thy fetters and thy insensibility, and learn to think as a man. Taste that noblest of pleasures which a mortal is capable of upon earth, that of tracing thy Creator in all things; and of knowing him in Christ as thy Father!

June 30.

On the Blight.

This is the name by which those insects are called which settle on the tops, stems, and leaves of plants, sometimes in such swarms as to cover them entirely. There are perhaps as many species of them as there are plants; and their singularity renders them the more worthy of our attention. One thing in which they differ from every other animal species is, that they not only lay eggs, but also produce young ones alive. As long as the fine weather

lasts, they are viviparous, i. e. the young proceed from their mothers full of life, and perfectly formed; because, no doubt, the plants at that time yield them sufficient nourishment. Towards the middle of autumn they lay eggs, which are not hatched till the spring following; for if the young ones were produced sooner, they would perish for want of food. The males appear precisely at the time when the females begin to lay; which seems to indicate that their existence is not necessary till then. This conjecture has been confirmed by experiments which have been made on these insects. If you take a young one at the moment of its birth, and put it by itself in a glass, it will produce one just like itself, when it has acquired a certain degree of growth; and at a week's end it will be surrounded by a numerous family. If you repeat the experiment on one of its young, and even on many generations, the result will be the same; which is a proof that these animals engender of themselves, without copulation.

We might also notice another singularity: in some sorts of insects the males have wings, and the females have none; but in the blight both sexes are alike: both are produced with, or both without wings. Those which have wings are so small, in comparison with the others, that they walk over them as they do upon fruit. But why are these singularities in nature? Why does the Creator sometimes deviate from the common laws? To give a satisfactory answer to this question, we ought to be able to take in the whole of all that is

created; to know at once all the parts of the immense kingdom of nature, and the connection that is between them; to be able to judge in what, and how far, each thing may be hurtful or injurious to the whole.

But we must be contented with general reasons; which may in some measure serve to solve the above questions.

God here shews us the command which he has over all nature. He is the supreme lawgiver, who assigns to each being the laws by which it must abide. He to whom all beings must submit, has a right to make and govern them as he pleases.

We find a great variety in nature, which affords us an opportunity, not only to rejoice in the contemplation of it, but to admire the glory of God.

Even the singularities in the natural world, enter into the plan of divine wisdom, and seem to teach us, that the singularities in the moral world, and the different states of men are equally under the direction of an all-wise Being, who orders all things after the counsel of his own will; and so as they shall redound to the glory of his holy name for evermore.

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REFLECTIONS

FOR

EVERY DAY IN THE YEAR,

ON THE

WORKS OF GOD,

IN

NATURE & PROVIDENCE.

FROM THE GERMAN OF

CHRISTOPHER CHRISTIAN STURM.

A NEW EDITION IN TWO VOLUMES,

EMBELLISHED WITH

TWELVE BEAUTIFUL ENGRAVINGS,

EMBLEMATICAL OF THE TWELVE MONTHS.

VOL. II.

"The works of the Lord are great, sought out of all them that have "pleasure therein". Psalm CXI. v. 2.

BUNGAY:

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1813.

REFLECTIONS

FOR

EVERY DAY IN THE YEAR,

ON THE

WORKS OF GOD,

IN

ORDER TO EXCITE US TO HIS LOVE.

REFLECTIONS, &c.

JULY 1.

On foreign Plants.

A GREAT deal of corn, and a great number of our vegetables, come from foreign countries, and generally from warmer climates than our own; most of them from Italy. They are brought thither from Greece; and Greece had them from the East. When America was discovered, many plants and flowers were found there, which were till then unknown; and which have been since transplanted into Europe with great success. The English, however, have still much difficulty in cultivating North American plants in their country. Most of the different sorts of corn on which the men and animals subsist, are grass-plants; but though our fields are now covered with them, they are foreign to us. Wheat and rye are indigenous in Little Tartary and Siberia; where they now grow without culture. We are not certain indeed from whence barley and oats come; but it is clear they are not indigenous in our climate; if they were, culture would be unnecessary. Rice is the produce

of Ethiopia. It has also been cultivated in America, since the commencement of the last century; and they now send us annually vessels entirely laden with this useful seed. The buck-wheat comes originally from Asia: the crusades brought in to Italy; from whence it came into Germany. Many of our herbs, and vegetables also, have a foreign original. Borage comes from Syria, cresses from Crete, cauliflowers from Cyprus, and asparagus from Asia. Chervil comes from Italy, aneth from Portugal and Spain, fennel from the Canary islands, and anise and parsley from Egypt. Garlic appears to be the produce of the East, shallots come from Siberia, and horse-raddish from China. Kidney-beans come from the East Indies, gourds from Astraçan, lentiles from France, and potatoes from Brazil. Tobacco was brought by the Spaniards, from a place of that name in the province of Jucatan, in America. The same may be said of the ornaments of our gardens. The most beautiful flowers are foreign productions. Jessamine comes from the East Indies, the cedar tree from Persia, the tulip from Cappadocia, the daffodil from Italy, the lily from Syria, the tube-rose from Ceylon and Java, and the pink and carnation from Italy.

In how many ways does the Creator provide for our happiness and enjoyment, by making the most remote countries contribute towards it! There appears to be an universal transmigration over all the earth. Men, animals, and vegetables transplant themselves, and pass from one region to another; and these successive changes will probably last as long as time itself.

In whatever part of the world it may please thee, O God, to transport me, may I endeavour to act uprightly, and bring forth fruit to thy glory, and the good of my fellow-creatures, until I arrive at those regions of bliss and perfection, where nothing shall be subject to change! Amen.

JULY 2.

On the Transformation of Caterpillars.

THE transformation of a caterpillar into a butterfly, is perhaps one of the greatest phænomena in nature, and in many respects merits our attention. The manner, in which caterpillars prepare themselves for their change, is truly wonderful. They do not immediately become butterflies, but pass through a middle state. Having cast their skins three or four times, they strip off their last coat, and become a substance which has no resemblance to a living creature. They then wrap themselves up in a shelly covering, called the chrysalis; and which is something like a child in swaddling-clothes. In this state they remain two or three weeks, and sometimes several months, till at last they come out from this species of sepulchre in the form of butterflies.

Properly speaking, there are two sorts of butterflies; the wings of the one are raised, the others lie flat. The first fly during the day, the latter during the night. The caterpillars of the nocturnal butterflies spin themselves to a cone, and shut themselves in it when the time of their transformation ap-

proaches. Those which are to be diurnal butterflies, hang themselves up in some convenient place; and in order to this, they make themselves a very small web with very fine thread; and then inverting their natural position, they suspend themselves so that their head inclines a little towards the top.

Thus both sorts of caterpillars bury themselves, as it were, alive, and seem to wait patiently the end of their caterpillar state; as if they foresaw, that after a short repose they were to receive a new existence, and should appear again in a greatly improved state, viz. that of a splendid butterfly.

This is a just emblem of the death and resurrection of the righteous. To true believers, death is only a species of sleep; a short and sweet rest after the pains and miseries of life. A moment, during which they are deprived of motion and life, as to their bodies; only that they may appear afterwards with more glory, and enter into a new and better life.

What is a caterpillar? A blind, creeping, despicable worm; which, while it drags on its life, is exposed to persecution and death every moment: and is not this the case with good men?

The caterpillar prepares itself with the utmost care for its change, and for that state of inaction and weakness in which it must for a time remain. Just so a true believer, before death comes, prepares by divine grace for the change that is before him. and waits the Lord's time to be dismissed from the body and raised from the grave, that soul and body may enter into a better state.

The weak and earthly body of a righteous man

will show itself after the resurrection, in a brilliant, glorious, and perfect state. As a mortal man, he was attached to earth, and occupied too much with sensual and earthly objects. But after the resurrection, he soars above thousands of worlds, and with a steady and penetrating eye he takes in all nature at once. Still his soul rises infinitely higher, he approaches the Deity, and is absorbed in the most sublime meditations. Before his death he was comparatively blind in his search after truth; now he sees and can behold it in its full lustre. His body being spiritual and incorruptible, he no longer requires gross aliment to satisfy his hunger. He lives on heavenly food, and his heart overflows with unmixed delight.

JULY 3.

The Silk Worm.

THE silk worms appear to be a family of caterpillars. They are composed of several moveable rings; and are well provided with feet and claws, to catch hold wherever occasion requires. They have two teeth, which do not act upward and downwards like ours, but from right to left; which they use to saw, cut and slope out the leaves. A vessel is seen through the skin of their backs, which seems to contract and dilate at intervals, and which performs the functions of the heart. This worm has nine orifices at each side, which correspond with so many lungs and assist in the circulation of the nutritive juices.

Under the mouth is a sort of reel, with two holes from which it emits two drops of gum, with which its bag is filled. These resemble two distaffs, which continually furnish the matter to make its thread. The gum which runs through the two holes takes that form and lengthens into a double thread; which suddenly loses its fluidity, and acquires the consistence necessary to support, and to contain the worm. It connects the two threads into one; gluing them together by means of its fore paws. This double thread, though it is so very fine, is nevertheless strong, and of an astonishing length. Each silk-worm's bag is formed of a thread five hundred German ells long; and as the thread is double throughout its whole length, each one contains a thousand ells, the whole of which weighs only two grains and a half!

The life of the silk-worm, in the caterpillar state, is very short: nevertheless it passes through different states, which insensibly bring it to perfection. When it first comes out of the egg, it is extremely small, and is perfectly black, especially in the head, which is more shining then the rest part of it. Some days after it assumes a dark-grey appearance. Afterwards its coat becomes dirty and ragged; then it throws it off, and appears in a new dress. It now becomes larger and whiter, but rather tinged with green, as green leaves are its food. After a few days, more or less according to the degree of heat, and the quality of its food and constitution, it ceases to eat, sleeps nearly two days; then it becomes exceedingly agitated: its extraordinary efforts turn it nearly red. Its skin wrinkles and shrivels

up: a second time it is thrown off, and cast away along with its feet. Thus in a month's time it has two new dresses, then it begins to eat afresh, and might very well pass for another animal.

After having fed for a few days, it falls again into a kind of lethargy; in recovering from which, it once more changes its garment. This is the third skin it has cast away since it came out of the shell. It continues to eat a little longer, and then leaves off entirely; prepares itself a retreat, and draws a thread off its reel, which it wraps round itself, much in the same way as we should wind thread about an oval piece of wood. This covering consists of extreme fine threads of silk. The worm rests quietly in the cone which it has spun till the end of about fifteen days, when it eats its way out, if it be not killed by being exposed to the heat of the sun, or that of an oven. Then the silk cones are thrown into warm water, and stirred about with small twigs, to remove the loose threads, and then the silk is wound off upon a reel made on purpose.

Thus we owe the luxury of our clothing to a worm or a caterpillar! This reflection ought to humble us. Let us remember, that the meanest animals, even those which are despicable in themselves, have been created for the use and benefit of mankind. A worm, which we can scarcely condescend to look at, becomes a blessing to whole provinces, a considerable object of commerce, and a source of riches.

Many persons resemble the silk-worm at least in this, that they pass a great part of their lives in feeding their bodies; but how few of them render them-

selves useful to the world by their labours! May it not be so with the reader!

JULY 4.

On the Rainbow

WHEN the sun reflects its rays on the drops of water which fall from the clouds, and we are placed with our back towards the sun, and have the cloud before us, then we see a rainbow. The drops of rain may be considered as little transparent balls, on which the rays fall, and are twice refracted, and once reflected: hence the seven colours of the rainbow, viz. red, orange, yellow, green, blue, purple, and violet. These colours appear so much the more lively, according as the cloud behind is darker, and the drops of rain fall thick and fast. The drops falling continually, produce a new rainbow every moment; and as each spectator has his particular situation, from whence he views this phænomenon, it so happens, properly speaking, that two men cannot see the same rainbow. This meteor can last no longer than the drops of rain continue to fall.

The rainbow, considered merely as a phænomenon of nature, is one of the grandest sights imaginable. It is a picture of the Creator's most beautifully coloured. But when we recollect, that God has made this meteor a sign of his pardon, and of the covenant he vouchsafed to make with mankind, then we shall find matter in it for the most edifying reflections.

When the rain is general, there cannot be a rain

bow As often therefore as we see this beautiful meteor, we may conclude with certainty, that we need not fear another deluge; for to effect one, there must be a violent rain from all parts of the heavens at once. Thus when the sky is only covered with clouds on one side, and the sun appears on the other, it is a sign that these dark clouds will disperse, and that the sky will soon become serene: and this is the evident reason why we cannot see a rainbow unless the sun is behind us, and the rain opposite to us. To form a rainbow, the sun and the rain must be seen at the same time.

How great is the goodness of God! He still remembers the world in mercy. He has not yet destroyed and he will never drown it more. Let us adore him whose covenant of grace is everlasting; ordered in all things, and sure.

JULY 5.

On Birds' Nests.

To any reflecting mind, there must appear to be many objects worthy of remark in the nests of birds. Is it possible not to admire those little regular edifices, composed of so many different materials, collected and arranged with so much skill and labour; constructed with so much industry, elegance and neatness; with no other tools than a beak and two feet! It is not so wonderful that the hand of man can erect large buildings, according to all the rules of art, when we consider that the artists are endow-

ed with reason, and have abundance of tools to carry their purpose into execution. But that a bird, notwithstanding its disadvantages, should be capable of uniting so much address, regularity and solidity in constructing its nests, is what we cannot too much admire.

How wonderful is the nest of the goldfinch! The insides are lined with cotton, fur, and fine silky threads. The outside is woven with thick moss, the colour of which resembles the bark of the tree on which the nest is built, that it may not be so easily discovered. In some nests, the hair, down, and straw are curiously interwoven. In others, the parts are neatly joined, and tied together with a thread, made by the bird itself, of flax, tow, and horse hair, and frequently of spiders' webs. The blackbird and lapwing, and some others plaster their nests with a thin coat of mortar, which cements all the parts together; and then before it is dry, they stick some moss, &c. to it, to render it close and warm. The swallows build differently to other birds. They use neither sticks, straw, nor ligaments; but with a sort of cement they form themselves nests in our chimneys, perfectly secure, neat, and convenient.

But the nests which deserve most to be admired, are those of certain Indian birds; which they artfully suspend on the branches of trees, to defend them from the ravages of some animals and insects. Almost all kinds of birds have their peculiar manner of placing their nests. Some build in houses, others in trees, or on the ground, but always in such a manner as may best contribute to their security, the

rearing of their young, and the preservation of their species.

We may conclude from the above reflections, that birds cannot be mere machines. It is evident, that in all their works they propose to themselves certain designs. They form their nests hollow, almost like the half of a globe, that the heat may be the better contained in them. The inside of their nests are lined with feathers, so that their young may lie soft and warm. How wonderful is the instinct of birds! Where do they learn that they are to have eggs, and that the eggs require nests to keep them warm, and to prevent them from falling? How comes it to pass, that their nests are neither too large, nor too small? Who teaches them never to mistake the time, and to calculate so exactly, as never to lay their eggs till their nests are finished? And who can explain these mysteries in nature? Mankind know too little of the souls of animals to know this satisfactorily: we may however conclude, that these faculties are the effects of divine wisdom and power.

JULY 6.

The many enjoyments we find in Nature.

LET us turn our eyes to whatever part of the creation we please, we every where find something that interests either our senses, our imagination, or our reason.

All nature is so formed, as to afford us numberless pleasing objects, and to supply us with a variety

of enjoyments, which continually succeed each other. Our constant taste for variety is always gratified. Each part of the day brings new pleasures, either to our senses or to our imaginations. While the sun illuminates the horizon, the plants and animals, with a thousand agreeable objects, strike our eyes; and even in the night we are charmed and transported with the majesty of the sky. Nature seems to labour on every side, to surprise us with new pleasures. We must be blind and senseless indeed, if we are not struck with this infinite variety, and if we do not acknowledge the wisdom and goodness of the Creator. The same spring that waters the valley, quenches our thirst, pleases our ear, and invites us to sleep. The shady forest, which defends us from the heat of the sun where we enjoy an agreeable coolness, and where we hear the melody of various birds, feeds at the same time a multitude of animals, which are themselves food for us. The same trees whose blossoms, a few months ago, delighted our eyes, will soon produce delicious fruits to please our taste; and the fields, now covered with waving corn, will soon supply us with plentiful crops. Nature presents no object to us that is not pleasing and useful in more respects than one. The merciful care of providence ordained, that, the colour of green, the most agreeable to the eye, should clothe and cover the earth. However agreeable this colour is in itself, variety adds to its charms: hence we see light and shade blended together. Landscapes covered with woods, brambles, pulse, and grass, present us with a picture truly magnificent; where the tints of green are infinitely varied, crossing and

intersecting each other, and blending themselves so as to be insensibly melted into each other; and yet are always in perfect harmony. Each month affords us different plants and flowers. A constant succession prevents any void in the vegetable kingdom. If any ask, To whom are we indebted for all these blessings? The hills and the valleys will tell them; the earth points it to their sight; the sky is a glass in which they may behold it; the thunder, the rain, and the rainbow, declare the wisdom and goodness of God. All things in nature bear the impression of his handy-work. The birds, with their melodious notes celebrate him. The bounding flocks, and the stag in the midst of the forests; the insignificant worm, and the enormous whale that spouts the waves to the sky, and sinks large ships; the terrible crocodile, and that moving mountain the majestic elephant; all the numerous hosts of animals which people the air, the earth, and the sea; they all declare the glory of God, and proclaim his existence,

And are we deaf to this loud and general voice of nature? How unpardonable if we are! O let us, who are the happy witnesses of the wonders of the Lord, let us, in the presence of all his creatures, pay him constant and grateful adoration. All things remind us of his goodness, and shew our obligations to praise him. May our souls be filled with grateful joy. The more we reflect on nature, and its various beauties, more sensible we shall be that our God is a God of mercy and love, and that the Christian religion is a source of real joy, and a continual motive for grateful praise.

JULY 7.

On the Flower Garden.

LET us now take a view of the flower-garden, and reflect on the number of different beauties assembled together in so small a space. The art and industry of man have made it a fine theatre of the most beautiful flowers. But this fine garden would be a desert, full of thistles and thorns, without care and cultivation. This is a just picture of uneducated youth; but when young persons are properly instructed, and brought up in the fear of God, they resemble the lovely flowers of a garden, which now delight with their beauty, and will soon produce fruit beneficial to society.

See the night-violet, which towards evening scents our gardens with its perfume. Though all other odours are absorbed in this, yet it has no beauty, and scarcely resembles a flower. It is small, of a grey colour, and tinged with green; so that it can scarcely be distinguished from the leaves. Modest without show or pretensions, it perfumes the whole garden, though it is scarcely noticed in the multitude; and it is difficult to believe, that a flower of so mean an appearance can shed so pleasing and so sweet a perfume. It resembles a person who is not beautiful, but who has a fine understanding, and the most amiable qualities. The righteous man often does good secretly, and diffuses all around him the savour of good works: but such a person, has often nothing of distinction, either in his person, condition, or rank.

But both beauty and a fine scent are united in the carnation. It is the most beautiful of all flowers. It almost equals the tulip in its colours, and surpasses it in the multitude of its leaves and the elegance of its form. A little bed of carnations is an emblem of a person in whom sense and beauty are united, and who knows how to conciliate the love and respect of his fellow-creatures.

Let us now take a view of the rose. Its colour, form, and scent, are all pleasing; but how weak and transitory is it! It soon loses those charms which distinguish it from other flowers. This is a useful lesson to those who shine only in beauty. It ought to teach them not to trust in their charms, or be vain of their short-lived excellence.

But how many flowers are already withered and fallen! Nevertheless, we should not complain of this instability. The world is a great stage, where we are not always to see the same actors. The variety in nature constitutes a part of its perfection. The charms of novelty affect us most: hence it is necessary there should be a succession of new objects. The short duration of flowers tends to increase their value; their absence makes us wish for their return. Were they continually before us, we should soon become satiated and disgusted. When once we have seen an object in all its different points of view, we have in some sort exhausted its beauties, become indifferent to it, and aspire after new pleasures. The variety and continual succession of earthly goods, is a mean which God employs to make our lives constantly agreeable.

Such is worldly happiness! "All flesh is grass,

"and the glory of man is as the flower of the field. "The grass withereth and the flower thereof falleth "away." Death leaves no traces of the outward charms which adorn any of the human race. Let us then seek after an interest in Christ, and our eternal happiness is secure. Wisdom, piety, and the blessings of true Christianity never fade; but are inexhaustible sources of eternal joy.

July 8.

A description of the usual phænomenon of a Thunder-Storm

However formidable the phænomenon of a thunder-storm may be, there is something so grand and curious in it, that the different effects produced by it deserve well to be examined: and this examination is the more necessary, as we are often prevented by excessive fear from considering this noble spectacle with sufficient attention.

When a stormy cloud, which is nothing but a collection of vapours strongly electrified, approaches near enough to a house or a tower, or an unelectrified cloud, so that a spark issues from it, that explosion takes place which we term a clap of thunder. The light we then see is the lightning, or the thunder-bolt. Sometimes we only see a momentary flash; at other times it is a train of fire in a zig-zag form. The explosion attending the lightning shews that the vapours which form the thunder, being suddenly agitated and enflamed, dilate the air with violence. A clap attends every electric spark

This is the thunder; which is sometimes composed of many claps, or prolonged in multiplied echoes. There is always some interval between the flash and the clap; and this may often lead us to judge of the degree of danger: for it requires a certain space of time for the sound to reach our ear from the place of the cloud; whereas the lightning reaches our sight with inconceivable swiftness. Therefore as soon as we see a flash of lightning, we have only to reckon the sounds in a watch, or how often the pulse beats between the flash and the clap. Whoever can count about ten pulsations or sounds from the time he saw the lightning till he hears the thunder, is a quarter of a league distant from the thunder cloud; for it is estimated that the sound takes the time of forty pulsations to the space of a league.

Lightning does not always proceed in a right line; but often winds about in all directions, and sometimes does not take fire till near the ground. The combustible matter which reaches the ground or takes fire near it never fails to strike; but sometimes it has not sufficient strength to reach us, and like a bomb ill charged, it is dissipated in the atmosphere, and does no hurt. When, on the contrary, the fiery exhalations reach the ground, they sometimes make a terrible havoc. The course of the lightning is very singular, and cannot be ascertained. It depends upon the direction of the winds, and the quantity of exhalations. The lightning goes in all directions, wherever it can meet with combustible matter: as when a grain of gunpowder is lighted, the flame runs along the train, and sets every thing it meets with on fire. The prodigious

force of lightning is manifest from its wonderful effect. So intense is the heat of the flame, that it burns and consumes every thing it meets with that is combustible. Even metals are melted by it; but it often spares what is contained in them, when they are sufficiently porous to give it a free passage. It is by the velocity of the lightning that the bones of animals and men are sometimes calcined, while the flesh remains unhurt; that the most solid buildings are thrown down; that trees are split asunder, or torn up by the roots; that the thickest walls are pierced through; that rocks and stones are broken and reduced to powder. When men and animals are found suffocated, their death must be attributed to the rarefaction and violent motion of the air, produced by the heat and velocity of the lightning.

Let us seriously reflect on this wonderful and dreadful phænomenon. How many are the wonders of a single thunder storm! We behold a heavy black cloud; it is the tabernacle of the Most High. It descends towards the earth; but it is God who "bows the heavens, and comes down with darkness "under his feet."—2 Sam. xxii. 10. The wind arises, the storm commences; but God himself is in the whirlwind, for, "he walketh on the wings of "the wind."—Psal. civ. 3. At his command the clouds disperse, and the hail, the lightning, and the thunder fly abroad. Hearken to his terrible voice, and to the threatening sound that goeth out of his mouth. He darts his lightning from one end of heaven to the other, and his light to the ends of the earth. Thus "the God of glory thundereth;" but though this terrible voice alarms the universe, his

JULY.

"The prodigious force of lightning is manifest from its wonderful effects."

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beneficent hand nourishes all his creatures abundantly, and his saving mercy is extended to all his chosen.

JULY 9.

On the Ants.

WE may consider the ants, as well as the bees, as a little republic, which has its peculiar government, laws, and police. They appear to live in a sort of town, divided into several streets, which lead to different magazines. Their activity and industry, in collecting and using the materials they require for their nests, is truly wonderful. They all lend a hand in digging the earth, and carrying it afterwards out of their habitation. They bring together a large quantity of grass, stubble, and twigs, of which they form a heap. This appears very irregular at first; nevertheless much art is discovered when it is examined with attention. Under the domes, or little hills which cover them, and which are always so formed as to let the water run off, there are what may be termed galleries, which communicate with one another, and may be considered as the streets of this little city.

But what is most remarkable, is the care which the ants take of their eggs, of the worms which come out of them, and of the nymphæ which are formed from the latter. How carefully do they carry them from one place to another. They feed their young, and remove, with the most tender solicitude, whatever might injure them. They even take care to preserve a proper degree of warmth

around them. Their hard labour during summer has for its principal object the preservation of their young. They themselves require no food in winter, as they are in an insensible state till the spring returns. No sooner are their young out of the egg, but they are employed in feeding them; and this gives them a great deal of trouble, for in general they have many houses, and they carry their little ones from one habitation to another, which they intend to people. They bring their chrysalis near the surface according as the weather is wet or dry, hot or cold. In mild weather they bring them to the surface; and even sometimes after a shower they lay them in the sun, or in a gentle dew after a long drought. But when night, cold, or rain approaches, they take their dear nurslings in their paws, and descend so far in the ground, that one must dig more than a foot deep in order to find them.

There are several sorts of these insects. The wood-ants constantly lie in wood or bushes, and do no harm to fields. Of these there are two species, the red and the black. Some of them lodge in the ground in dry places, and generally choose those parts where they find the roots of fir and birch trees, and there fix their habitation. Others live on old trunks of trees above ground; high enough to be out of the way of the moisture of the ground beneath. They form themselves apartments in the cavities of the trunk, and cover them with straw, to preserve them from the snow and rain. The field ants likewise, are either black or red, like the former, but much smaller. When the weather is dry, they bury themselves pretty deep; but as soon as it becomes

rainy, they gradually raise their habitation higher; and when the rain abates, they invariably return to their subterraneous apartments.

But are such mischievous insects as these worthy of our notice? they make sad havoc in our fields and meadows; they make the earth hollow, tear it up and hinder plants and vegetables from growing; they are enemies to the bees and silk-worms; they hurt our flowers, and injure the roots of young trees, and commit other depradations. And hence it is they are so cruelly persecuted, and destroyed wherever they are found. If they gathered honey, though at the expense of a million of other creatures, they would be highly valued; but because their labours hurt some useful plants, we imagine ourselves authorised to exterminate them. But surely the little injury they do, does not render them unworthy of our attention. Should we regard nothing but what we derive benefit from? Let us throw aside this prejudice. May not even the ants contribute something to our amusement and instruction? The formation of their limbs, their industry, the police of their republic, their tender care of their young, and many other properties, may convince us of the wisdom of that Being who is the Creator of all things. For of all the works of God, there is not any without its use, and which is not worthy of admiration, even though it should be useless or hurtful in our sight. Nothing is created without design, or in vain. Let the sluggard go to the ant, and not leave her house till he has learnt some useful lesson, and made some progress in wisdom and goodness.

JULY 10.

Hail.

HAIL is nothing but drops of rain, which, freezing in the air, fall in pieces of spheric, oblong, and angular forms. Should it appear strange, that in the very warmest season of the year vapours are found to congeal in the atmosphere; it should be considered, that even in the greatest heats the upper region of the air is cold, and often filled with snow. Were not this the case, how could the highest mountains continue covered with snow the whole summer? In the hottest parts of America the cold is so intense on the tops of high mountains, that the traveller is in danger of being frozen to death. In consequence of this excessive cold in the upper regions, it would snow in the hottest weather, if the frozen particles did not melt before they reached the earth. When the particles of snow unite together the drops begin to freeze; and as in falling they pass through the warmer regions of the air, it happens, that before this warmth can have dissolved them, their cold increases so much as to freeze them entirely. It might be imagined that the cold, on the contrary, ought to abate in proportion as they pass through a warmer air. But when in winter, water, which has been exposed to the open air, is brought into a warm apartment, what is the consequence? it freezes and becomes ice; which would not have been the case, had it been put in a cold room. This is exactly the case with the meteor in question. When cold bodies pass suddenly into hot

air, their cold increases to such a degree as to turn to ice. The volatile salts contribute greatly to this. Therefore we need not be surprised that storms are not always accompanied with hail; as it requires great abundance of saline vapours to occasion the sudden freezing of the drops of water. Although hail be most frequent in summer, yet it falls also in the other seasons; for as the saline vapours may ferment in the atmosphere in every part of the year, so it may hail in winter, spring, and autumn.

Hailstones are sometimes round, sometimes concave and hemispherical, and frequently conic and angular. Their usual size is like that of small shot, and they are seldom as large as nuts. It has however been asserted, that some have fallen as large as a goose's egg. Their difference in form and size may proceed from many accidental causes. The violence of the winds, particularly when they cross one another, certainly contribute much towards this. Besides a hailstone in its fall may meet with many other cold particles, which considerably increase its size. When the hail is very large, it certainly does inexpressible mischief to the harvest and vintage. Yet the advantages derived from the storm, may more than counterbalance the injury it does. The hail evidently cools the air in the burning heat of summer.

Here again, O my God! thou shewest thy wisdom and goodness; therefore would I glorify thee, even in the midst of hail and storms; for thy hand does wondrous things, and thou never ceasest from scattering thy blessings among mankind.

July 11.

The use of Storms.

In all the operations of nature, we may discover the wisdom and goodness of our heavenly Father. But how little is this subject thought of by the generality of mankind; and for this reason our minds ought to be more deeply impressed with it. God sometimes makes use of natural causes to punish the sins of men; yet even these tokens of his displeasure may tend to the good of the whole. The phænomenon before us may serve to convince us of this. Many of us, in our infancy, were perhaps accustomed to pronounce the words thunder and lightning with terror. We are so unjust, that we never think only on the injury done by storms; while we shut our eyes against the great advantages which result from them to creation at large. But how soon should we change our tone, if God, provoked by our ingratitude and complaints were to deprive us of the benefit we derive from thunder-storms! Though we cannot point out all the advantages resulting from them, the little we do know, should fill our hearts with gratitude to our great Benefactor.

Let us represent to ourselves an atmosphere loaded with an infinity of noxious and pestilential exhalations, which thicken more and more by continual evaporations from terrestrial bodies: so many of which are corrupt and poisonous. We must breathe this air, our preservation depends upon it. The salubrity, or unwholesomeness of the air, brings life

or death. We feel how difficult respiration is in the stifling heat of summer: with what difficulty we breathe! and what uneasiness and anxiety we feel: Surely then it is a great blessing, for which we should praise God, when a salutary storm comes to cleanse the air from all the noxious vapours; and by lighting up the saline and sulphureous particles, prevent their dangerous effects, cools the air, which recovers its elasticity, and renders respiration pleasant and agreeable.

Without such storms, destructive exhalations would multiply and become more and more corrupt; men and animals would perish by thousands, and an universal plague would render the earth a general grave-yard. Is it not most reasonable then to wish for storms? It may be added that not only men and animals are benefited by purifying the air, but it is also of great use to the vegetables. The rain that falls from a thunder-cloud is the most fruitful to the earth.

The above reflections may serve to moderate our excessive fear of thunder: which shews how little confidence we have in our heavenly Father. Instead of yielding to frightful and terrible ideas, let us accustom ourselves to consider a storm as a sublime and great object. Instead of praying to God that there may be no storms, let us rather request him to vouchsafe to send them now and then; or rather let us entirely depend upon that great Being, who always governs the world with wisdom and goodness. Whenever a storm arises, let us say in the fulness of our hearts, and with an entire faith, "Almighty God! it is thou who commandest the

"thunder, and directest the lightning: we are in "thy hands! Thou alone canst save, and thou only "canst destroy. At thy command the storm shall "lay waste our country, or make it fruitful. Thou "art great, O Lord, and boundless is thy power. "We are thy children, and thou art our merciful "Father! When thou speakest to us in the angry "thunder, thou intendest to bless us. Blessed be "thou, O Lord, from eternity to eternity; and let "all thy people, whom thou hast redeemed, say "hallelujah! Amen."

JULY 12.

On the Earth, and its original construction.

THE earth is so constructed by the all-wise Creator, that it is fit for the production and growth of trees, plants, and herbs. It is compact enough to contain and hold the vegetables so firm, that the winds cannot sweep them away; and yet it is light and moveable enough to permit the root to sink downwards, and extract humidity and nutritious juices. When the surface of the earth is parched and dry, that very lightness permits the juices to ascend, as in capillary tubes, to furnish the trees with necessary nourishment. The earth is also full of juices which are good for the growth of plants. And that all sorts of vegetables may grow and draw their subsistence from the earth, God has formed different kinds of soils, which serve us for a variety of purposes: such as potter's earth, chalk, clay,

and gravel. Some serve to make bricks, and some to make earthen ware.

The unevenness of the ground has many advantages : it makes room for a greater number of plants and animals. The mountains also serve to break the violence of the winds. In their bowels are contained those metals and minerals which are so useful to us : they also give rise to springs and rivers. The stones that are under ground serve to build walls, and to make lime and glass. As to metals, they have innumerable uses. Nobody is ignorant of the use of minerals. Salt serves to season our food, and to keep it from corrupting; and bodies are rendered combustible by the sulphereous particles they contain. Even volcanoes and earth quakes are useful and necessary. If fire did not consme the sulphureous exhalations, they would be so much diffused in the air, as to render it unwholesome. If such things appear useless to us, it must be imputed to our ignorance. Whatever imperfections appear in nature, they are designed to contribute to the perfection of the whole. In order to judge of the works of God, and to acknowledge the wisdom of them, they should be considered in all points of view ; then nothing would be deemed superfluous, but all things useful and necessary.

Many things appear insignificant to us because we are ignorant of their use. Put a loadstone into the hands of a man who does not know its virtue, and he will scarcely deign to look at it : but tell him that the progress of navigation, and the discovery of America, are owing to that stone and he will instantly form a very different idea of it. It is the

same with many things else, which we despise or judge ill of, because we do not know the use of them, nor see the connection they have with the whole.

O God the earth is full of thy goodness! As long as I live on it, may I adore its Maker; and when I am called to leave it, may I ascend to my exalted Redeemer, to dwell with him in that better world, and behold his glory. Amen.

JULY 13.

On the Phases of the Moon.

THAT the moon has a particular motion, by which she turns round the earth from west to east, is evident from a great many observations. For after having placed herself between us and the sun, she rises from below him, and continues to go back towards the east; changing from day to day the place of her rising. At the end of fifteen days she reaches the most eastern part of the horizon, at the time the sun sets with us; then she is in opposition. In the evening when the sun retires, she arises above our horizon; and sets in the morning about the time when the sun rises. If then she continues to describe the circle round the earth, which she has half finished, she will depart visibly from the point of her opposition, approach nearer and nearer to that luminary: rise later than when in opposition to him, till at last she has got so near as only to be discovered a little before his rising. This revolution of the moon round the earth, explains why it

rises and sets at such different times, and why its phases are so various and yet so regular It is plain to every body, that a globe illuminated by the sun, or by a flambeau, can receive the light only on one of its sides. It may be perceived at first sight that the moon is globular and receives her light from the sun. When, therefore, she is in conjunction, i. e. between us and the sun, she turns all her illuminated side towards the sun, and her dark side towards us; and of course is then invisible. She rises with the sun, in the same region of the heavens, and also sets with him. This is called the new moon; but when the moon retires from under the sun, and goes back toward the east, then she has no longer the whole of her dark side turned towards us, a small part of her then comes in view. This illuminated border is seen on the right side towards the sun, just at his setting, or perhaps a little before. The horns of this crescent are turned to the left, facing the east. The moon becomes more visible to us the farther she removes from the sun. At the end of seven days, when she has reached a quarter of her course round the earth, she discovers more and more of her illuminated side, till one half of her is visible. The enlightened part is then turned towards the sun; and her dark parts cast no light on the earth: exactly half the moon is then enlightened. The half of that half can only be the one fourth part of her whole globe; and it is this fourth part which we see. The moon is then said to be in her first quarter.

By degrees, as the moon removes from the sun, and as the earth comes between them, the light occu-

pies a greater space in that part of the moon which faces us. At the end of seven days, counting from the first quarter, she is nearly opposite to the sun; and then her whole disk, perfectly illuminated, is presented to us. Then she rises in the east, precisely in the moment when the sun sets in the west, and we have a full moon. The next day the enlightened part is a little turned from us, and the light gradually leaves the western side; stretching over that part which does not face the earth. This is the decrease of the moon, and the more it goes forward, the more the dark side increases; till at last half the dark side is turned towards the earth, and consequently half the light side. Then she is in what we call the last quarter.

By the admirable harmony which subsists between the motion of the moon on her own axis, and her motion round the earth, it so happens that she always shews us the same half of her sphere which she has shewn from her first creation. This globe has finished her revolution in twenty-seven days and eight hours for near six thousand years. Regularly, and at the same periods, she has enlightened sometimes our nights, and sometimes those of other countries. How remarkable are the wisdom and goodness of God, in granting to our earth such a faithful companion, to enlighten almost half our night!

Alas! we do not sufficiently value this wise appointment of God. But in some parts of the world the light of the moon is more indispensable than it is with us; and we should hope the inhabitants of those parts feel proportionate gratitude.

The continual changes of the moon are a lively

emblem of the revolutions to which all earthly things are liable. Health, joy, affluence and a thousand blessings besides, concur sometimes to make us happy; and if I may say so, we walk in a blaze of light; but at the end of a few days, or weeks, all this splendour vanishes, and leaves only the sorrowful remembrance of having enjoyed those frail blessings. How ardently, therefore, should we long to pass from this uncertain world, to a region of never-ending felicity, where there shall be no more changes, but even mortality shall be swallowed up of life.

JULY 14.

Mineral Waters.

MINERAL waters are doubtless a precious gift from heaven, whether we consider them in respect to their formation, or in respect to the many advantages derived from them. But the places where the springs of life and health flow, are seldom what they ought to be—places consecrated to praise and gratitude to God. O that the following reflections may tend to make us more grateful to our Benefactor!

First, let us consider the sources whence we draw the common salt to season our food. Most probably these sources derive their origin from the mineral salt which is dissolved by the waters under the earth. Nor are the mineral hot-baths less remarkable. They are so very numerous in Germany, that nearly two hundred and twenty are

reckoned; and the waters of them are so hot, that they must stand to cool more than twelve hours before they are fit to bathe in. What can be the cause of this extraordinary heat? Certainly it is not the sun. Were it occasioned by his influence, the water would retain its warmth only during the day: and they would grow cold in the night, and in winter. Nor can this heat be attributed to subterraneous fires, for then it would still be necessary to account for the medicinal virtue of these waters. Perhaps the most simple, and at the same time the most probable cause we can assign is, that the waters, passing through earth strongly impregnated with sulphureous, pyritous, and metallic substances, acquire this degree of heat. When the waters fall into these quarries, the sulphureous and ferruginous particles which it dissolves, take fire by the friction and re-action of their particles, and communicate that heat to the water which runs over them.

Medicinal waters, especially the acid, are produced by their dissolving and mixing with the minerals which they wash away. They are particularly found in places where there is abundance of iron, copper, sulphur, and pit-coal. Hence it is that their taste and effects are so very different, in proportion as they are more or less impregnated with the above principles. When they are produced by bitter roots, saltpetre, or copper, they are bitter. They are cold when they proceed from rocks, or when they are impregnated with sal ammoniac, alum, &c. Oily and bituminous substances make them oleaginous. Brimstone mixed with acids make them sulphureous.

While we reflect on these salutary and inexhaustible springs, let us adore the divine goodness which has prepared them. Doubtless mineral waters may have other uses; but it is evident they were intended for the health and preservation of man. Let us therefore acknowledge the goodness of God, and be sensibly affected with it. Let those especially, who have experienced their salutary and strengthening virtues, be deeply penetrated with gratitude and love to their heavenly Father. Let them, if rich, glorify him, by imitating his example, causing their riches to become springs of life, and consolation to their fellow-creatures in necessity.

JULY 15.

The continual activity of Nature in the Vegetable Kingdom.

WHOEVER wishes to know why nature is constantly active throughout the year, needs only reflect on the innumerable advantages which result from this constant activity. Vegetables were designed for the use of men and animals; both for food and pleasure to the former, as food only to the latter. The gracious Creator, in order to bestow nourishment on mankind in the most pleasing manner, ordained that the plants, instead of coming all at once, should succeed each other. Indeed were they produced at the same time, none of the above ends could be accomplished. Men could not find time to get in their different crops, if every thing was ripe at the same time. Nor could all of them be preserved, as

many are of short duration, and soon lose their taste and quality. What would then become of the pleasing sensations which they procure both to our eye and to our palate? What taste would cherries and other summer fruit have, were we to eat them in winter, covered with snow and ice? Were the grapes to ripen in the height of summer, the wine itself, perhaps would be changed into vinegar. How could so many millions of animals live, if all the produce of the earth came to maturity at the same time?

It is supposed there are a hundred species of insects which are nourished only by flowers: if the flowers lasted but a month or two, how could they exist? It is true, that the greatest part of insects find no food in winter; but they are so constructed, that at the time their provisions fail they fall into a deep sleep, and so require no support. But this could not take place in summer, because the heat would keep them awake. If then nature was otherwise planned, men, as well as animals, would not only suffer by it, but even perish with hunger. And it may be asserted that their support is one of the principal ends which God has proposed in establishing such a continual activity in the vegetable kingdom.

If we next reflect on the pleasures of sight and taste, which God has been pleased to grant to men, we shall find that in this respect also it is necessary that nature should be constituted as above remarked. It required that she should produce flowers in all their beauty, and that she should do this through the whole year for the continual enjoyment

of men. In spring, when gentlemen go to the country, in order to view the many productions which the Creator causes to spring up for our food, we behold the trees in full bloom. A thousand beautiful flowers charm the sight in summer: they succeed each other as long as man can enjoy this object. Lastly, when the cold winter takes place, and when we shut ourselves up in our houses, nature produces other vegetables, which are not, indeed, alluring to the sight, but which have a thousand uses. Hence we may infer, that the pleasures and comforts of mankind are purposes proposed by God in the plan of nature. All things are so ordained, as to provide sufficient nourishment for animals and men. Each plant has its allotted time, and appears precisely when most useful. Wisdom shines through all the works of God. Let us therefore bless him, and give him glory for all things; especially for the blessings of redemption. Jesus Christ is the plant of renown. He is always in season, and produces, as the tree of life, all manner of blessings for his people.

JULY 16.

On the beauty and utility of Fields and Meadows.

THE sight of a large and beautiful garden in summer, gives us a lively pleasure which we find not in our houses, and of which we cannot form even a just idea. But the pleasure which we feel when walking in the meadows and fields surpasses the pleasure afforded by the finest garden. The stately

tulip, the elegant narcissus, the beautiful hyacinth, do not yield so much pleasure as the simple flowers which enamel a fertile valley. Gardens are covered with beauty, but in the fields we see a union of beauty and utility. The pleasure of useless beauty is but momentary. In most gardens our view is confined, and our liberty appears to be bounded; but when we walk in the fields and meadows, we fancy ourselves more independent, and more at ease.

In the country in summer, fruitful and beauteous nature varies her appearance every moment; but there is a sameness in the appearance of our gardens. Even their order and regularity prevent us from being long pleased with them; we tire of them when they have nothing new to offer. On the contrary, the eye wanders with pleasure over objects continually diversified, and extending as far as the sight can reach. The rising hills, with which the horizon is surrounded, afford us at once distant and agreeable objects; and what is still further to be remarked, nature has spared us the trouble of watering those flowery gardens. An innumerable multitude of seeds are sown in them; which produce an almost uninterrupted verdure. Nor is this prodigious variety for the purpose of pleasing the eye only; they have each a seed, a blossom, and qualities, and beauties peculiar to themselves. Certainly the same species of herbs are prodigiously multiplied in each field; but we scarcely take a step without passing over a hundred different kinds, each of which has its peculiar structure and use.

To the pleasure which the sight of fields affords

us, our beneficent Creator has joined the greatest advantages. They produce plants for our food, and a great many simples, which serve for medicine. But the greatest use the fields are of to us, is the feeding, almost without expense, those animals we can the least dispense with. Oxen require no food but grass. That useful animal, the horse, requires no other recompense for his labour than the free use of the fields, or a sufficient quantity of hay. The same support serves also for the cow, whose milk is one of the greatest supports of our life. The field is the most complete inheritance. It only costs the slight trouble of gathering what it yields. Its productions are not casual; for it seldom happens that pastures are ravaged either by drought or inundation.

But why do men overlook the divine goodness as seen in fields and meadows? We look upon grass with indifference, probably because it grows under our feet, and requires no cultivation: how inexcusable is this indifference! O that we had a deeper sense of the Creator's goodness! We are encompassed with benefits. The mercy of the Lord is every where. There are traces of his good providence in every corner of the earth. The whole earth is one immense pasture, where all living creatures may at once find nourishment, pleasure and delight.

JULY 17.

The Morning Twilight.

WITHOUT doubt this phænomenon, which we daily behold, is equally with others designed for the benefit of the world. The twilight is nothing more than a prolongation of day; which prepares our eyes, sometimes to bear the full light, and at other times the darkness of the night. Twilight is not always the same; it varies according to different climates and seasons: at the poles it continues longer than in the torrid zone. The people of that zone behold the sun rise directly above their horizon, and sink down in the same direction under the lower hemisphere, by which means they are all at once left in total darkness. On the contrary, the sun darting his rays obliquely towards the poles, and not sinking much below the horizon of the neighbouring people, their nights, though long, are mostly attended with twilight, and therefore are in some degree luminous. There is wisdom in this arrangement; and it tends to increase the happiness of the inhabitants of those parts. We who inhabit the temperate zone, plainly observe, that our twilights become shorter in proportion as the days shorten; and that they increase as the days lengthen. We enjoy in the evening an hour of twilight, and sometimes more, after the sun is set: previous to his rising we have a twilight of an equal length. We owe this useful arrangement to the properties which

God has given the air. He has encompassed the earth with an atmosphere, which rises very high: he has made such proportion between the air and the light which pervades it, that when the rays enter it perpendicularly, nothing disturbs its course; but when a ray enters it obliquely into the air, instead of passing through it in a direct line, it is bent downwards; so that most of the rays pierce the atmosphere along-side of the earth by means of this reflection. For instead of pursuing their direct course in passing by the earth, they are reflected by the air: thus when the sun approaches our horizon, many of his rays which are not sent directly to us, meeting with the mass of air which surrounds our globe, are bent in that mass, and sent back to our eyes: in consequence of which we have day-light long before the sun himself appears. This refraction of light in the body of air which surounds us, is a work equally full of wisdom and goodness for all the people of the earth; but it is a peculiar blessing to the inhabitants of the frigid zones. If they had no twilight, they would be plunged in frightful darkness for several months together.

It is possible that this explanation of the cause of twilight may be not intelligible to some readers. Further details, however, of this phænomenon may be left to philosophers; let us consider it as reasonable beings, and as Christians. If our hearts be right with God, we shall not view it with indifference. The simple and unlearned Christian is often wiser than many philosophers, who, while they study nature, lose sight of that supreme Being, who gives to man the light of the day. May the Sun of righte-

ousness shine upon us through life: and at death, may we enter into that world where there shall be no darkness at all; but where the Lord shall be our everlasting light, and our God our glory!

JULY 18.

On the Evening Twilight.

THE evening twilight is that faint light which is visible after sun-set, particularly in the west. It is partly occasioned by the refraction and reflection of the rays of the sun in our atmosphere, and partly by the atmosphere of the sun himself, known by the name of zodiacal light; which sometimes appears, especially in spring, towards evening, and towards morning in autumn. When the sky is serene, the smallest stars are visible at twilight, which continues from sun-set till dark at night, and often lasts two hours. In the island of Senegal, where the days and nights are generally equal, the twilight lasts but a few minutes. The interval between sun-set and the darkness of night, is very little more than a quarter of an hour. Thus, as soon as the sun is twelve or fourteen degrees below the horizon, darkness is spread over the whole country, and it is like midnight. It is about the first of March, and the eleventh of October, that our twilights are the shortest. When the northern declination of the sun, and the depression of the equator below the horizon, are such that the sun descends only eighteen degrees, the twilight then lasts the whole night. This is the reason that in the summer solstice we have

scarcely any night; and that there is none at all in countries more north, though the sun is below the horizon.

Evident advantages are derived from twilight. To pass suddenly from broad day to dark night would be very inconvenient. So sudden a change might greatly injure the organs of sight. Travellers would lose their way, and birds be in danger of perishing. All these inconveniences God hath graciously prevented; as by means of twilight we pass gradually and gently from day to night, and from night to day.

JULY 19.

On the Ephemeron Fly.

EPHEMERON signifies half a day; and this insect is so named because of the short duration of its life in the state of a fly; and it undergoes five transformations. First, the egg, which contains the principles of its life. Secondly, a caterpillar proceeds from the egg; the caterpillar becomes a chrysalis, the chrysalis becomes a nympha, and the nympha becomes a fly. This fly lays its eggs on the water, where they are hatched by the heat of the sun. Each egg produces a very small red worm, which winds about as it moves. They are found in abundance in ponds and marshes during the whole summer. But when the water begins to be cold, the worm makes itself a little sheath, in which it passes the winter. It ceases to be a worm towards the end of winter, and passes into its third state, viz. that of a chrysalis. It sleeps

in this state during the spring, and by degrees becomes a beautiful nympha, or kind of mummy, almost in the form of a fish ; on the days of its metamorphosis, it appears stupid and inactive. At the end of six hours the head shews itself, and rises by degrees to the surface of the water. Afterwards the body disengages itself slowly, till at length the complete ephemeron comes out of its sheath ; it then falls on the water and remains some minutes without motion ; but by degrees it begins to revive, and feebly stirs its wings, at length it moves them quicker, tries to walk, and then to fly. As these flies are all hatched nearly at the same moment, they are seen in swarms, jumping and playing in the surface of the water for the space of two hours. The male and female then seek each other for two hours more. Then they begin again to skip and play, lay their eggs, and presently after fall down and die. Thus they finish their short life at the end of five or six hours ; and they never survive the day that gave them birth.

Let the history of the life of these insects teach us how false a judgment we form of the duration of our lives, in comparison of eternity. Suppose that one of these flies had attained to the age of twelve hours, and thus arrived at the most advanced age relative to its companions, the greatest part of which died at noon. If this old insect could speak, perhaps it would address the following discourse, just before it expired, to its assembled friends —" I now " find that the longest life must end. The term of " mine is arrived, and I do not regret it ; for old " age became a burden to me : besides I no longer

" saw any thing new under the sun, From all that
" I have seen during the course of my long life, I
" am convinced that there is nothing here certain or
" durable. A whole generation of my species have
" been destroyed by a violent storm. The coolness
" of the air has carried off many of our children in
" their bloom. I existed in the first ages of the
" world; I have conversed a great deal with insects
" much more robust, respectable, and intelligent
" than any of the present generation. I can assure
" you, that the sun, which is now nearly down, I
" have seen in the midst of the sky. In those an-
" cient times light was more vivid, and its heat more
" strong than they now are; and our ancestors were
" more sober and virtuous than we their children
" are. I have seen many things; I have had a very
" long experience; I have out-lived all my contem-
" poraries. My life began when the sun arose.
" For years, without number, it has traversed the
" sky with majesty, and every where spread its be-
" nign warmth. But from its situation and appear-
" ance now, I plainly see that the end of all things
" is at hand. O my friends, I once flattered myself
" that my life should never end! I had formed
" beautiful cells to live in, and built very fond hopes
" on the goodness of my constitution, my strength,
" my agility, and the use of my wings. But I have
" lived long enough; and none that I leave behind
" me will run so long and happy a course as mine."

Thus might an insect speak that had lived on the earth nearly twelve hours: and might not a man nearly fourscore years old hold nearly the same language? The difference between twelve hours

and fourscore years, is nothing in reference to eternity. Let us ask ourselves, Do we live to a better purpose than the ephemeron? May the reader live long enough to know Christ, and to taste the peace of God which passeth all understanding! So shall an entrance be administered to him abundantly into the everlasting kingdom of our Lord and Saviour Jesus Christ.

July 20.

Nothing in Nature perishes.

Were any thing in the world to perish without any good resulting from it, we might call in question the wisdom of the divine government. But there is reason for beleiving, that in the whole circle of creation not even the smallest grain of dust has ever perished: but that every thing exists for certain purposes, which shall certainly be accomplished. The seed that falls from a flower is not destroyed, but disposed of in a way consistent with infinite wisdom. If some seeds are devoured by birds, they mix with their juices, and in time prepare manure for fields, for the use of men and animals. There are some things indeed which corrupt and dissolve, but then they become parts of some other substance, and under a new form serve the designs for which they would not have been proper in their former state.

The butterfly could not produce its like without being first a caterpillar. Not a single animal, as we now see it could ever have been produced, if its

germ had not pre-existed in the first animal of its species: nothing then in nature perishes. Things are only separated and dissolved, in order to appear in a new form, and become parts of some other substances. We may call every grain of dust the seed of a new creature, that holds its proper place in the chain of beings which have been produced for the perfection of the whole. If you take a handful of sand from under your feet perhaps you destroy the lives of millions of insects which inhabited the grains of sand. Were we better acquainted with the internal parts of things, we might with more certainty determine what the other substances were, in which they were before, in a manner, concealed, and into the composition of which they entered.

"But may not abortions, or children who die as "soon as they are born, be considered as creatures "which perish without being of any use?" Certainly not. They fulfil the designs of the great Creator, and are prepared, by different revolutions, for their future state. Nature works gradually. Man is first an infant, and the tree a twig. Each creature exercises its power during its continuance, and prepares itself for a new state. The state that man must take to pass from this mere sensitive life of childhood, to the rational life of advanced age, certainly is not greater than that which the infant takes from its mother's womb to the sensitive life. It would therefore be as proper to say, that the old man had not fulfilled the design of the Creator, as to say that the infant has not. All creatures answer the end of their creation in a particular way. Like the wheels of a machine, some move quick, others

move slowly; but all tend, in a nearer or more remote manner, to the end of their existence; and contribute, according to their power, towards the general plan formed by the Creator.

We may find many things in nature which, to us appear useless; and consequently to have been formed without design. We may think that others have been entirely destroyed and annihilated. But let us guard against judging rashly, and too readily blaming the ways of God. Let us rather admit, that all God's plans are wise and good, and that he fulfils his designs even when we, by reason of our ignorance, can form no idea of the ends he proposes. The plans of Jehovah are all wisely connected. All things occupy their proper place, and nothing comes by chance. All things have their use, even when turned to dust. Nothing perishes, not even the smallest leaf, nor a grain of sand, nor even what is invisible to the human eye. The majestic firmament, where the sun shines with so much splendour; the dust which sports in his beams, and which we respire without knowing it; all has appeared at the command of the Creator! all exist never to end!

All is good and perfect in the world, which God has created; and yet there are some who dare to criticise his works. Let us not resemble those madmen; but rather aim at the glory of our Creator. Though our bodies must be laid in the grave, yet even these shall not perish; but at the last day shall rise, if we die in union with Christ, to enjoy everlasting life.

JULY 21.

The difference of Zones.

THE adorable Creator having formed the earth globular, and having impressed upon it a double motion, it followed of course, that the regions of the earth should differ from each other, not only in the temperature of the seasons, but also in the plants and animals which they produce. In certain countries there is but one season; they have continual summer, and each day is as hot, or hotter, than our hottest summer days. Those countries are situated in the middle of the globe, and include the space called the torrid zone. Those fruits which are most grateful to the smell and taste, are produced there. Indeed nature seems to have poured out her richest gifts there. The days and nights are of equal length in this zone, during the greatest part of the year.

On the other hand, there are countries where, during the greatest part of the year, it is so extremely cold, as to be beyond our severest winters. A few weeks in the year, it is just warm enough for the few plants and trees which the country produces to grow and become green. But scarcely any thing is produced in these frozen regions proper for the nourishment of man. The greatest inequality of day and night is there: both, in their turns, last for whole months together. The two temperate zones, situated between the torrid and the frigid zones, occupy the greatest part of our globe. There are always four seasons in these countries, more or less dis

tinctly marked as they approach to the torrid, or on the other hand, to the frigid zones. 1. The spring, in which trees and plants begin to bud and blossom when the heat is moderate, and the nights and days are nearly of equal length. 2. The summer: in this the fruits of the field and trees ripen; the heat is greater, and the days longer than the nights. 3. The autumn, when the fruits and seeds begin to fall, and the grass wither, and when the days and nights are again of equal length, and the heat moderate. 4. The winter; during which the vegetation ceases, or nearly so; the nights lengthen, and the cold more or less increases.

The countries of the temperate zones are so situated, that in those who lie near one of the sides of the torrid zone, the seasons are diametrically opposed to those of the other temperate zones. When it is summer in one, it is winter in the other, &c. The produce is more various in those countries than elsewhere. Wine is peculiar to those countries; for the vine cannot be cultivated either in intensely hot, or in severely cold climates. The advantages of mankind in those climates are very great. In the frigid zone, the inhabitants are stupid, and short in stature; those of the torrid zone are of a weak constitution, possess warm passions, and have less natural and intellectual powers than the inhabitants of the temperate zones.

However diversified the regions of the earth may be, the Governor of the world has provided for the well-being of those who inhabit them. Each country produces what is requisite according to the climate. The silk-worm, which feeds on the leaves of

a mulberry-tree, spins for those of the torrid zone; the silk of which forms their clothing: and a certain tree, like a shrub, bears a shell or husk filled with fine wool, of which light clothing is easily made. On the other hand, quadrupeds abound in cold countries; the skins of which serve for clothing: and they are furnished with thick forests, which supply them with abundance of fuel. The inhabitants of the South have cooling fruits, to prevent their blood from being too much inflamed. In the North, God compensates for the want of the produce of the earth, by the great quantity of fish contained in the sea, and by the number of animals that are found on the land.

Thus there is no region on the globe which does not experience the excellence and goodness of the Most High. There is no country, however barren and poor we may deem it, where nature is not bountiful enough to provide the necessaries and the comforts of life.

O God! how boundless is thy beneficence! May thy blessing of redemption soon be as extensively known and enjoyed as the bounties of thy providence, which all the inhabitants of the earth are blessed with!

JULY 22.

The singularities of the Sea.

THE sea in general, is considered only in a terrible point of view, without reflecting on the wonders and blessings it so visibly presents to us It must

indeed be acknowledged that the sea is a most formidable element, when its waves swell mountains high, and the tempest roars. In such cases, ships are often driven far out of their course, and are so violently dashed that they fill with water, and are swallowed up. Sometimes the storm drives them upon the rocks or sands, and they are dashed to pieces.

Whirlpools, are those masses of water which cause the vessel to turn rapidly round, and at last swallow it up. These gulphs and whirlpools are occasioned by great cavities in the sea, where rocks and opposite currents meet. No less dangerous are the water-spouts which the wind lifts from the sea up to the clouds. They hover in the air above the ocean, and the wind whirls them round with violence. They frequently burst with a great crash, and do much damage; for when they come near a vessel they mingle with its sails, raise it up, and shake it to pieces, or precipitate it to the bottom. Many ships perish in this way.

But let us also reflect on the goodness which shines forth even in the depths of this abyss. The saltness of the water claims our first attention: a pound of water contains two ounces of salt. Though the salt is lighter than what we use in common, yet it is not drawn up into the air; nor does it diminish by the continual flowing in of the sweet water: the cause of this is unknown. Possibly there may be mountains of salt in the sea. But if the saltness proceeded from this, would not the waters be salter in some places than others? But this does not appear to be the case. Even the torrents and rivers

may carry into the sea nitre and salt particles; but what would that be in such a vast extent as the ocean! but whatever may be the cause of this saltness, it is very necessary for certain purposes It preserves the water from putrefaction, and renders it so strong and weighty, that the greatest burdens may be carried on it from place to place.

The colour of the sea is worthy of our notice. It is not every where the same. In shallow waters, the colour of the bottom and of the sky is to be seen. Deep waters are black; during a storm they become white, and covered with froth. When the rays of the setting sun fall upon the waters, they are silvered, gilded, and shaded with the most beautiful colours. When it is calm, the sea appears sometimes to be covered with brilliant stars. The track of a ship, which cuts the waves, is often luminous, and appears like a river of fire. These phænomena must be partly attributed to oily and inflammable substances in the sea, and sulphureous particles.

One well-known property of the sea is, the flux and reflux. The sea ebbs and flows twice in the space of twenty-four hours. When the tide rises, it is called the flux, or flood; and it is termed the reflux, or ebb, when the tide falls. Several remarkable circumstances attend this phænomenon. There is always a flux and reflux at the same time in two parts of the globe; and these two places are opposite to each other. When our antipodes have high tides, ours are the same. When we are in the first and last quarter of the moon, the tide is always lowest; and our highest tides are generally three

days after the new and full moon. But accidental causes may contribute to the vari ion of the tide. This is a very useful phænomenon; both as it tends to purify the water, and promote navigation. But the inhabitants of the sea may excite our admiration and surprise if nothing else can. Here a new world appears, composed of a prodigious number of beings. The species of aquatic animals may be fewer than those which live upon the land, but the former surpass the latter in size, and live much longer. What are the elephant and ostrich in comparison of the whale, which is the largest fish in the sea! It is from seventy to eighty feet long when full grown, and lives as long as an oak. If certain accounts are to be credited, there are some animals in the sea even larger than the whale. This is a sort of crab, called kraken, said to inhabit the northern seas, and which is half a German mile in circumference. But who can count the number, and de scribe the form, structure, and size, of these differ ent animals? How infinitely great is that God who formed the sea, and all that is therein! This is the conclusion we must draw from such reflections. There are the most cogent reasons why God has designed the ocean, and the seas should occupy two-thirds of our globe. The seas were not only to be great reservoirs of water, but also, by means of vapours which arise out of them, were to become the source of rain and snow.

Great wisdom is discoverable in the connection the seas have with each other, and in their uninterrupted motion. It is also worthy of remark, that the bottom of the sea is nearly of the same nature

with the surface of the earth. Rocks, valleys, caverns, plains, fountains, rivers, plants and animals, are found in the sea. What are the isles of the sea but the summit of a long chain of mountains? But the sea may still be full of unexplored wonders, which, could we know them, would be further proofs of divine wisdom and power. God has every where fixed monuments of his greatness. May it be my happiness to adore him here, and to be set up to all eternity hereafter, in the most public place in heaven, as a monument of his redeeming love, and an infinite debtor to his free and efficacious grace! There shall I swim in a sea of love, full of wonders, without a bottom or a shore.

JULY 23.

The various Shades observable in Flowers.

I CAST my eyes with a heart-felt pleasure on surrounding objects, and every where discover the numberless beauties the creation affords. How lovely is that assemblage of colours which I behold! How pleasing and varied the mixture; and what art appears in the disposition of those shades! There a light pencil seems to have laid on the colours: here they are blended according to the nicest rules of art. The colour of the ground is always such as best serves to relieve the drapery; while the green which surrounds the flower serves to set off the whole. What is the divine intention here but to procure us agreeable sensations?

Lord! how numerous and great are thy works

All thy decrees are full of wisdom. I would admire the greatness of thy designs, and still more the means thou makest use of to fulfil them. Man can not compass any work without some difficulty. But thou, O God! in a single moment, hast given existence to millions of creatures, and formed them in a state of perfection. The more we examine the works of art the more defects we discover in them. But though thy great works have been contemplated for thousands of years, no fault could ever be found in the plan, nor could any thing be imagined more perfect than the manner in which they are executed. The more I observe thy works, the more I am astonished at their beauty!

What most delights me in the shades and colours of flowers is their simplicity. One would suppose that God must employ an infinite number of materials to embellish nature in such a manner, and to distribute amongst the plants and flowers so many bright, rich, and beautiful colours. But it requires no painful exertion in God to make the creation a scene of wonders. A single element in his hand assumes the most beautiful and varied forms. The moisture of the earth and air insinuates itself into the tubes of plants, and is filtered through a series of transparent pipes. This is what works all these wonders, and produces all these beauties which we behold in the vegetable kingdom. It is the sole cause of the charms, the perfume, and the growth of flowers. Had each colour its particular cause, the admiration of the spectator would be diminished; but we contemplate with pleasure, and can never tire of admiring, as the effect of

divine wisdom, a work, which diversified in its parts is nevertheless simple with respect to its cause and in which we behold many effects depending on a single spring, which always act in the same manner.

My present examination of the colours of flowers, teaches me more than ever the value of the reason with which I am endowed. Without that faculty flowers would exist in vain for me. But now, I not only know them, but am sensible of their beauty, and can take a pleasure in them. I can even do more by divine grace: I can raise my thoughts to my Creator, and find even in their colour traces of his perfection. I can never be too thankful for the gift of reason.

O God! it is right, that at the sight of thy works I should bless thee for the faculty thou hast given me to know their beauty, and to be able to enjoy them. Without this faculty, what should I be, and what would the world be to me?

JULY 24.

The great Heats of Summer.

JULY is generally the hottest month in the year. Perhaps it will appear extraordinary to some, to hear that the sun, which now enters the sign Leo, removes every day further from us. While we were nearer this luminary, the heat was moderate; and now it is more intense. This is perfectly consistent, however, with the laws of nature: and we must seek for the reason of it in the plan of our globe. The sun was

nearer to us not long since; but as its rays were not strong enough to penetrate deep into the earth, we could only perceive a moderate warmth; yet in the space of some weeks, the earth, and whatever is on its surface, are so far heated, that even a less degree of the sun produces more effect than in the beginning of the summer, when it acted upon cold bodies. Some are dissatisfied with this plan of nature. They complain of that burning heat which enfeebles their bodies, and renders them incapable of much labour. But how unreasonable are such murmurs! Is it not ungrateful to our heavenly Father to blame his government, which always is intended to promote the welfare of the world? Why should we wish the season less not? Do we wish the fruits of the earth not to ripen, that are to support us in the ensuing winter? Does not God soften every evil by the advantages which are annexed to them? For instance:—The inhabitants of the western part of Africa, especially those of Cape Green, and the Island of Corea, are exposed the whole year to the intense heat of the sun. But such is their constitution, that they do not suffer by it; and the winds which blow continually in these countries, serve to temper and cool the air.

And has God manifested less love to us? How unpardonable should we be, were we insensible of the many proofs which he gives us of his kindness, even in this hot month? The summer nights tend greatly to cool the air: they bring with them a coolness which prevents the air from dilating, and enables it to act the more forcibly on every thing. One single night revives the languishing plants, refreshes

the animals, and so invigorates mankind, that they forget the weight and fatigue of the day. Even the storms which terrify us, are means made use of by our heavenly Father to cool the air and moderate the heats. How many fruits are there likewise of a cooling quality, and which tend to correct the acrimony of the bile! This relief is the more valuable, as the very poorest of us may enjoy it. Let us never more then complain of the heat of the sun, or of any burdens we labour under. All belong to the plan of divine wisdom.

JULY 25.

Several things remarkable in Animals.

THE animal kingdom contains more wonders than any part of nature besides. And to a lover of natural history, the different instincts and properties of animals are a very interesting study. But it is something more than an agreeable object to a reflecting mind; and the operations of animals induce him to trace them back to that wisdom which is unfathomable, and surpasses all human conception. This is the effect I wish to produce, by pointing out the singularities in certain animals.

There is something admirable in the manner in which birds and insects lay their eggs. The grasshopper, the lizard, the tortoise, and the crocodile, never trouble themselves either about their eggs or their young. They lay their eggs in the earth, and leave the hatching of them to the care of the sun. Other animals, by a peculiar instinct, lay their eggs

in places where their young find food as soon as they are born. The mothers are never mistaken. The butterfly, which proceeds from the cabbage caterpillar, never lays her eggs upon flesh; and the fly, which feeds upon flesh, never lays her eggs upon cabbage. Some animals are so attached to their eggs, that they carry them with them wherever they go. The spider which is termed the wanderer, carries hers in a little silken bag. When they are hatched, they place themselves in a particular order upon the mother's back, who travels about with the load, and continues her care over them for some time. Certain flies lay their eggs in the bodies of living insects, and sometimes in their nests. Every plant serves to feed and lodge many insects. A fly perforates an oak-leaf, and lays an egg in the hole it has made. This wound quickly closes; the place swells up, and there appears an excrescence on the leaf, commonly called the gall-nut. The egg that was inclosed grows with this gall-nut, and the insect as soon as it is born finds both food and a habitation.

The care which animals take of their young, is almost incredible; and their love of them sometimes exceeds their love of life. With what tenderness the quadrupeds nurse their young. If wounded, they effect a cure by licking them. When danger threatens, they convey them from one place to another. If they are carnivorous, what pains does the dam take to get a morsel of flesh! With what art she teaches them to catch their prey, to amuse themselves with it when they have gotten it, and then to tear it in pieces. It is almost impossible to read

without emotion the account of a bitch, who while they were dissecting her, continued to lick her whelps, as if she sought in this maternal care some relief to her own sufferings! and set up a lamentable cry the moment they were removed from her. Certain sea-animals, during a storm, hide their young in their bellies, and then let them out when the storm is over. Each species of animals has its peculiar situation and wants; God provides for both. For example, let us consider those which are obliged to seek their food in the water, and especially the aquatic birds. Their wings are covered with a gluey oil, through which the water cannot penetrate. By this means they are not wet in diving, which would prevent their flying. The proportion of their bodies is also different from those of other birds. Their legs stand more behind that they may stand erect in the water, and raise their wings above it. They are web-footed, that they may be able to swim. In a word, they are formed just as their way of life required they should be.

The nautilus is a kind of shell-fish, something like a shell-snail. When it wishes to rise, it places itself on the forepart of its shell, and to make itself lighter, it throws out the water by a little opening. When it wishes to sink, it draws itself back into the bottom of its shell, which filling with water, becomes heavy and sinks. If it wishes to sail, it artfully turns its shell, which becomes a little gondola, and then spreads a little membrane to the wind, which serves for a sail. Perhaps it might be the nautilus that first taught the art of navigation to mankind.

It is the same with the actions of animals as with

their make. The same wisdom that formed their bodies, arranged their members, and assigned them a common use, has also regulated the different actions we see them perform, and directs them to that end which was designed in their first creation. The beast is led on to this by the invisible hand of God! It produces works which excite our admiration, and appears to act from reason. When it is necessary it stops; regulates its work according to circumstances; and yet perhaps, only follows the impulse of certain hidden springs which cause it to move. When it has executed its work, it cannot judge of it, but is directed by the adorable wisdom of God, which has circumscribed every insect, and every plant, within a sphere from which it cannot depart.

When, therefore, we observe the instinct and the industry of animals, we should feel a sentiment of veneration, and think we behold a scene where the Creator conceals himself behind the curtain.

July 26.

The Human Face.

Even the exterior of the human body proclaims man's superiority over all other living creatures. His face, directed towards the heavens, proclaims his dignity, which is in a certain sense so impressed on all his features, that we may in some measure judge from the countenance of a man what the importance of his destination is. When the soul is in a perfect state of tranquillity, the features are calm

and composed; but when it is agitated by disorderly passions, the countenance becomes a living picture where the passions are painted with equal energy and delicacy. Every affection of the mind has its peculiar impression, and every change in the countenance is the true characteristic of the secret emotions of the heart. The eye in particular so visibly expresses them, that it is almost impossible to mistake it. It is the most immediate organ of the mind. The most tumultuous passions, and the gentlest affections, are painted with great exactness in that mirror. We may therefore term the eye the true interpreter of the mind, and the organ of the understanding. The colour of the eyes, and their motion, more or less quick, contribute much to characterize their physiognomy. The eye has in fact but one motion, though it may appear to move from side to side.

In most animals the space between the eyes is so great, that they cannot possibly see the same object with both eyes at once, unless it be at a considerable distance.

The eye-brows are those parts of the face which, together with the eyes, contribute much to the formation of the countenance. As these parts differ widely from the rest, their particular colour renders them more striking than the rest of the features. They may be deemed the shade of the picture, which exhibits the drapery and colours. The eye-lashes, when they are long and thick, contribute greatly to the beauty of the eye, and give it a more pleasing look. No creatures, except men and monkeys, have both their eye-lids adorned with eye-lashes.

Other animals have none on the lower eye-lid. The eye-brows move only upwards and downwards. The eye-lids are a guard to the eyes, and prevent the cornea from drying. The upper one can rise and fall of itself. The under one moves very little. Though we can move our eye-lids at pleasure, yet it is not in our power to keep them open when they are weighed down with fatigue and sleep. The forehead is the most important part of the face, and greatly contributes to its beauty if it be well proportioned. The nose is that part of the face that projects, but is the least moveable; and as it is seldom put in motion, except in a violent passion, it serves more for the beauty of the whole, than for any expression resulting from it. On the contrary, the mouth and lips are capable of many changes, and, next to the eye, express the passions best. The tongue serves also to animate and set it in play. The redness of the lips, and the white colour of the teeth, add to the charms of the face.

How admirably are beauty and utility connected in all the works of Jehovah! "Bless the Lord, O "my soul! and all that is within me bless his holy "name."

JULY 27.

The Gravity of Bodies.

THE Creator has endowed bodies with a force which acts at all times, in all places, and in all directions. If a body endeavour to move towards one point with greater force than the other, we then

say that it gravitates towards that point. Experience teaches us, that bodies are inclined to descend, or, that if they be far from the surface of the earth without support, they will fall in a straight line. We must not seek the cause of its gravity merely in the body itself, for a body that falls remains in the state in which it fell till displaced by some other cause. Nor can the air be the cause of this gravity; since, being heavy itself, it must resist the swiftness of the fall of bodies. The cause, therefore, must be sought elsewhere. It is most probable that the earth has the virtue of attaching bodies placed at a certain distance, as the magnet attracts iron; or else it must be attributed to a foreign substance distributed throughout all bodies.

But if we cannot exactly determine the cause of gravity, we may easily see many advantages arising from it. Without it we could not move as we do. Our centre of gravity is about the middle of our bodies. When we lift up the right foot, we must bear this centre on the left. If we stoop forwards, we are in danger of falling, but by putting out the right foot we prevent the fall, and make a step. Thus our walking is, in some sense, a series of continually prevented falls, during which the centre of gravity is preserved between our feet. For this reason we bend forward in going up a hill, and backward in going down. We also lean forward when we carry a burden on our shoulders, and backward when we carry it before us.

This is all according to the laws of gravity, which govern the motions of animals when they fly, walk, or swim. The immense bodies which roll in the

heavens are governed by the same laws. The sun attracts the planets, and the planets attract their satellites; or, what is the same thing, the planets gravitate towards the sun and the satellites towards the planets. For a body made to turn round, always flies in a direct line from the centre, if its course be not obstructed. The planets run their course with the greatest swiftness, and the moon is not chained to the earth. Hence it appears that a motion so rapid as that of the moon must throw it into unlimited space, if there were not a force which continually pushed it towards our globe, and became a counterpoise to its centrifugal force. That power is the gravitation of the moon towards the earth. If the earth itself were either heavier or lighter than it is, what must be the consequence? It would either be too near, or too far from the sun. In the first case, the heat would be intolerable; and in the second, the cold would be insupportable. All things on earth would be frozen, or burnt up.

O Supreme Wisdom! here again I find a monument of thy wonders. By a cause so small in appearance thou givest motion to the heavenly bodies, and to all animals. By the certain laws of gravity thou preventest the least grain of sand from being lost upon this or any other globe. But it is in this that the greatness of thy power and wisdom consists, that often the greatest and most astonishing effects are produced by means which appear to us the most insignificant.

JULY 28.

Many Effects in Nature proceed from the same Cause.

NATURE is an endless chain of causes and effects; and as all parts of the universe are connected together, each motion and event depends on a preceding cause, and in its turn will become the cause of what is to follow. The whole constitution of the world is well calculated to convince us that nothing came by chance; but that divine wisdom and art beyond our conception first created this astonishing edifice, impressed motion on its different parts, and determined the great chain of events depending and following each other. It is easy to acquire this degree of knowledge; for though what we have naturally is very limited, we still see numberless important effects derived from causes evident to the human understanding. Many natural phænomena may elucidate this matter.

What variety of effects does the heat of the sun produce! It not only contributes to the life of an innumerable multitude of animals, but likewise to the vegetation of plants, and to the ripening of fruits; to the fluidity of water, and to the elevation of vapours and the formation of clouds, without which neither rain nor dew would fall upon the earth.

The air is also so constructed as to effect a variety of purposes at once. By means of it animal bodies are preserved, the lungs cooled, and all its vital motions acquire energy. It is the air which kindles

fires, and nourishes the flame. By its motion and undulation it quickly conveys all sorts of sounds to the ear. It gives a spring to the winged tribes, and enables them to fly from place to place. It opens to man an easy passage through the seas, the vast expanse of which he could not otherwise pass over. By it the clouds are supported in the atmosphere, till becoming too heavy they fall again in rain. It prolongs the day by evening and morning twilights; and without it the gift of speech, and the sense of hearing, would be useless to us. This wonderful element which surrounds our globe, which is too subtile to be perceived by the eye, and whose force notwithstanding is so great, that no other element is able to resist, is surely an evident proof of the wisdom of God. The force of gravitation alone, which exists in all things, holds the earth firm, preserves the mountains, and gives fluidity to the waters. It confines the ocean in its depths, and the earth in its orbit. It keeps each being in its proper place in nature, and preserves proper distances between heavenly bodies.

The various uses and properties of water are indescribable. It serves in general to dilate, to soften and mix a great number of bodies, which otherwise would be useless. It is the most wholesome of all drinks: the best nourishment to vegetables; gives motion to mills, and to a vast number of machines, procures us a multitude of fish; and supplies us with the treasures of other countries.

The effects produced by fire are various and innumerable. Bright solid bodies are melted and changed into fluids, or become solid bodies of ano-

ther kind. It causes fluids to boil, or reduces them into vapour. It gives heat to all other bodies, and contributes to give the sensation of light to all animated beings.

The above remarks will apply to the moral world. Oftentimes one single disposition of the mind produces as great a variety of effects. Consider, for example, the natural inclination we have to love one another. Hence proceeds parental tenderness: the connection of friendship; patriotism; goodness in those that govern, and fidelity in those that obey. Thus one single propensity keeps each individual in the circle prescribed, forms the bounds of society, is the principle of all good actions, of all laudable pursuits, and of all innocent enjoyments. These are irrefragable proofs that the world was not made by chance, neither are the materials that compose it without connection and relation to each other. On the contrary, the world is a regular whole, ordained with infinite wisdom. Traces of this wisdom shine through all the parts of nature: yet much more is undiscovered and unobserved by the most profound philosophers; for finite minds can never sound the depths of infinite wisdom. "The works of the "Lord are great, sought out of all them that have "pleasure therein."

JULY 29.

On some Diseases of Plants.

EVEN vegetables are subject to many diseases. Sometimes they are covered with whitish matter

which sticks to them like powder—this is called the mildew. It does not proceed from insects, as some have thought; but from a natural stagnation of the juices, and a commencement of corruption, which attracts the insects, and induces them to lay their eggs upon it. The first stage of corruption, is the stagnation of the juices; and it is thought that this alone is sufficient to attract insects, because they are seen swarming by millions when once the circulation of juices is stopped in a tree, either by natural or other causes. For this reason the weaker and worst trees are the most subject to this malady. Were the insect the cause of it, it could not be produced by art, whereas if a tree be designedly wounded, or deprived of the care it requires, this is enough to bring the mildew. On a tree thus injured by art, you may presently see millions of insects, while the neighbouring trees are free from them.

There is frequently something resembling dew, but which is glutinous, sweet, and corrosive, that burns and spoils the plants. This is called the honey-dew. It was imagined that the insects extracted this gluey matter from vegetables, or that bees brought their honey there. But from repeated experiments, it is now allowed that this matter falls from the air in the form of dew. In some countries it lies in little drops on a number of different vegetables, and in one night's time it covers almost all the leaves of a long row of trees, on which there was none before.

Perhaps this dew may be formed from the exhalation of flowers, and the blossoms of trees, from which the bees extract such excellent honey. And

its falling in one place more than in another, may be owing to the direction of the winds. Perhaps also, this matter may be the effect of some disease in plants, whose juices are vitiated, and which may attract insects as the mildew mentioned above. The leaves on which this sort of dew falls, often spot, blacken and wither, and most likely this substance may be the cause of it.

Here are new proofs of the Creator's wisdom; for as the insects require food to live upon, it is for our benefit they should be obliged to seek it on those vegetables which, on account of their diseased state, would be unprofitable or injurious to us. We avenge ourselves on those creatures which are troublesome to us, by seeking to destroy them; but probably we should be more induced to spare them, if we considered how useful they are and how little real harm they do us.

JULY 30.

The means of Subsistence which Nature provides for Animals.

IT is a proof of the Creator's goodness and power, that there is every where food enough to support all the living creatures with which the world is filled. Indeed it is not so wonderful that the temperate zones should produce a sufficiency for those that live there; but that it should be the same every where else, even in those places where we could not expect to find food and pasture, and that the necessary aliments should ever be found in sufficient quantities to

support so many species of animals is what must be attributed to the tender care of the Almighty.

Food is proportioned to the number and wants of the animals which are to live upon it. Almost every where it may be found in abundance, but not in such profusion as to corrupt, which would be an evil to us. What is most useful and necessary, is in general the most common, and multiply the most easily. Many creatures feed on grass, and in what abundance is it produced! How easy is the culture of corn! how astonishing is its increase! and how necessary for the support of mankind.

The different tastes of animals are a proof of the wisdom of God. If all sorts of animals must have had the same kind of food, the earth would speedily become a vast desert. How comes it to pass that the animals choose to feed so differently? Is it owing to chance? Or rather, is it not to be attributed to a natural instinct which God has given them, and by which they make choice of such food as is adapted to their nature? But by this means all the productions of the earth and sea are disposed of, and every thing that breathe is provided for.

Food offers itself spontaneously to most beasts, notwithstanding they require great care to discern it; and must be cautious and prudent in their choice. Their aliments are so prepared, that what is food for one animal is poison to another. Botanists have found, after many experiments, that cows eat three hundred and sixty-seven kinds of herbs, and reject two hundred and eighteen. That goats use four hundred and forty-nine and leave one hundred and twnety-six. That sheep feed on three

hundred and eighty-seven, and that there are one hundred and forty-one which they will not eat. That horses take two hundred and sixty-two, and reject two hundred and twelve. That swine are contented with seventy-two, and reject the rest. Other animals are obliged to seek their food with much labour, and at a great distance. Many are obliged to choose the most favourable time of night to satisfy their hunger in safety; others to prepare their food to pick the seeds out of their shells, if hard to bruise them, to swallow little stones to help digestion, to take off the heads of the insects they feed on, to break the bones of their prey, and to turn the fish they have taken, that they may swallow them by the head. Many would perish if they did not provide food for the future; and others would starve if they did not lay snares or dig holes in which they catch their prey.

O how many occasions do we find to magnify the name of the Lord! Let his name be praised by every thing that has breath.

Aug. 1.

A Meditation on the Works of Nature.

Father of the universe! Preserver of all that breathe! how great is thy majesty! and how many wonders hast thou exhibited to man! Thou hast stretched out the heavens, and set them with thick stars! How resplendently does the sun now shine! To-morrow, perhaps, it will not be my happiness to enjoy the pleasure of hearing those birds sing, which

now fill the woods, valleys, and fields with their melodious notes. I feel symptoms of mortality. My life fades away like the grass of the field, and the leaves in autumn. Who knows when it will be said to me, "Man, return to dust!" Who can tell when the grave shall have swallowed me up, and when I shall become food for worms to devour? Those possessions which I now enjoy will no longer call me master.

How foolish should I be if I were to attach myself too strongly to the perishing things of time, to aspire after great riches, or be ambitious of empty honours; or if allowing myself to be dazzled by vain splendour, envy and pride should be cherished in my heart? O God! I desire to humble myself before thee, on account of the many sins I have already committed. Behold here I am, fulfil all thy gracious designs respecting me! Man a being swollen with pride, would give laws to his Creator. He even dares to blame the decrees of eternal wisdom. Thou O God! art the compassionate friend of men! Thou lovest them more than they love themselves, when in goodness thou deniest them those sinful enjoyments which are the objects of their wishes.

When in a morning, on a green turf, covered with dew, every thing presents itself in a pleasing form; when the wings of the night have cooled the sultry air of the summer, wisdom cries out to me, "O mortal! why dost thou torment thyself with anxious cares about the future? Is not God thy Father? art not thou his child? will not he who made thee take care of his own work? The plan of thy existence is not confined to time, but takes in eternity. Life is

but a moment, and the longest earthly felicity is but a pleasing dream. O man! thou art destined for immortality; the thoughts of which raise us above the earth, the universe, and all time! May it awaken my heart, when false pleasures would seduce me from the path of duty.

The roses which crown the head of the wicked shall soon fade. They are dishonoured by shameful enjoyments. I am but a sojourner upon earth, and none but immortal joys are worthy of my pursuits. May my heart be inclined to love nothing but goodness, and may I be a partaker of that holiness, without which no man can see the Lord!

Aug. 2.

On the Vegetation of the Stalk of Wheat.

The wheat plant is composed of the principal stem, and the stalks growing out of the sides, and the different branches which they throw out. It begins to form as soon as four green leaves make their appearance. If the little plant be then taken, and the under leaf be cautiously pressed or separated; there will be seen a little white point, which gradually grows into a stalk; and under the first leaf the little root appears. The white point, springs out of the substance of a knob, opens into green leaves, and shoots out on the side a new point. But these several points, and the stalks they produce, are not all designed to bear fruit; many of them wither, and are lost. When the principal stem has sprung up, there is a considerable revolution in the

plant, and all the sap is then employed in the formation of the blossoms and fruits. But prior to this, when the plant begins to vegetate, there are four, and sometimes five leaves, which spring from so many knobs. They prepare the nutritive juice for the ear of corn, which appears in miniature in spring, upon opening a stalk through the middle. Even in autumn this ear may be seen like a little cluster, to which the knobs are very closely united. When the plant begins to put forth its seed, the two upper leaves of the stalk join together, enclose the ear, and protect it till it has acquired some consistency. Before this, all the knobs, and particularly the two last, though soft, are very closely connected, and very little space between them. But when once the ear has pierced through its coats, all its parts lengthen, and the leaves give them all the juices they contain. The knobs harden by degrees, and the under leaves dry up. The blossom next appears. It is a little white stalk, extremely slender which proceeds from the juice of the grain. It is surrounded by several other little stalks, which are at first yellowish, but afterwards turn brown, till at last they become blackish, a little before they fade and fall off. The chief design of these stalks is to nourish a little cluster which is in the bag of grains, which contains the germ, and which comes to perfection long before the mealy substance appears. This substance gradually multiplies, whilst the sap collects round the part extremely fine and delicate, resembling down. This down, among other uses, serves to support the opening of the great canal which goes through the corn. When the fruit has

attained its full growth, it ripens. Then the stalks and the ear whiten, and the greenish colour of the grains become yellow and brown. Still, however, these grains are very soft, and their flower contains much moisture; but when the wheat is quite ripe, it becomes hard and dry. The construction of the smallest blade discovers the most consummate wisdom. Even the leaves have their use. It seems as if the wisdom of the Creator had placed them round the blade, for the same reason that an architect raises a scaffolding about a building, which he takes away when the building is finished. For when once the blade has attained its full length and consistency, the leaves dry up and fall off. Whole months pass away before the ear ventures to expose itself to the action of the air; but as soon as all is prepared for the formation of the fruits and flowers, they appear in a few days. How skilfully are the tubes and ears constructed! If the tubes were higher, the nutricious juices could not so well penetrate them. Had the grain been placed lower, birds and other animals could easily reach to, and destroy it. Were the stem weaker and thinner, it would be broken by the wind; and if it were stronger and thicker, small animals and birds would lodge in it, and pick out the grain.

Beneficent Father! may all those who behold a field of wheat experience all the sentiments of love and admiration which thy goodness ought naturally to excite! While thou feedest me with the finest of the wheat, do thou also feed my soul with the bread of life, that I may live for ever. Amen.

Aug. 5.

The Dog-Days.

The earth has not only a diurnal, but also an annual motion, by which it is carried from west to east, and by this means returns to the same star in the heavens, in 365 days, from which it appeared to have been removed for six months, and to which it seemed to approach for the other six months. For this reason the ancient astronomers divided the seasons according to the stars which the sun meets in its annual course. This course they divide into twelve constellations, which are the twelve signs of the zodiac, termed the twelve houses of the sun, because he seems to dwell a month in each of them. When the sun enters the sign Cancer, which happens the 21st of June, the summer begins with us. The sun is then in the zenith, and his rays come down almost perpendicularly upon us; and it is at this time that the heat of the summer begins, which gradually increases in the following months, as our globe is more heated by the burning rays of the sun. For this reason, July, and part of August, are generally the hottest part of the year; and experience has proved that from the 20th of July, to the 10th of August the heat is at its height. The dog-star is the brightest of all the stars in conjunction with the sun. Lost in the sun's rays it disappears from us for a month, (as is the case with every star the sun meets with in his course,) and the time of its disappearing is the time of the dog-days.

These observations are designed to combat a rooted prejudice among many people. An antient tradition attributes the heat which is commonly felt in these days to the influence of the dog-star on the earth, on men, and on animals. The following circumstance is sufficient to confute the above absurd opinion: that the occultation of the dog-star in the rays of the sun, does not always take place in that time which we call the dog-days. Properly speaking, the dog-days do not begin till the end of August, and do not end till the 20th of September. And as the dog-star, or Sirius, always advances further, it will in time reach to October and November; and at last even to January, so that the most intense cold in the year will prevail in the dog-days.

When we reflect on this we may plainly see that it is impossible this star should occasion the great heats which we suffer, or the effects which they produce. When therefore in the supposed dog-days, the wine or beer spoils in bad cellars; when things liable to ferment turn sour; when springs and stagnated waters dry up; when dogs and other animals, and even men are seized with madness, this does not happen because a star conceals itself behind the sun: it is the excessive heat of the air at that season which is the sole cause of those effects. Who ever can suppose that certain figures which the imagination forms to itself in the heavens, can have any influence on our globe, and on the health and reason of man, discovers great weakness of understanding. Instead of accusing the stars, we ought generally to blame ourselves for the evils we suffer,

Such prejudices indulged, are sinful reflections on the wise and good providence of God. Can it be supposed that an infinitely good Being, the Governor of all worlds, has created any thing in the heavens or in the earth, for the purpose of tormenting his creatures. All the Creator's plans are wise and good: let us seek to be reconciled to him by the blood, of Christ, and view him as our merciful Father, who will not even suffer an hair of our heads to perish contrary to his will.

Aug. 4.

On Sleep.

We go to sleep more or less quickly, according to the constitution and state of health; but whether it be quick or slow, it always comes in the same manner, and similar circumstances precede it in all men. The first thing that happens is a stupefaction of the senses; which no longer receiving exterior impressions, slacken, and gradually become inactive. The attention then fails and is lost, the memory is confused, the passions are calm, and the train of thought and reasoning becomes irregular. When we feel sleep coming it is but the first step, and cannot yet be called sleep. At most it is only dozing. We lose all consciousness when quite asleep. A stiffness of the muscles succeeds a stupefaction of the senses. This is the second degree towards sleep. Several symptoms are produced in the machine by this state, which may be observed in those who sleep in a chair: the eyes wink, open and shut of them-

selves, the eye-lids fall down, the head totters and falls forward, we endeavour to support it, but it drops still lower, and we lose all ability to raise it up. The chin rests on the bosom, and we sleep quietly. If our sleep be sound, all voluntary or animal functions are suspended, but the vital or natural functions are performed with greater force. This is the third change which sleep occasions in us. Sleep tends to promote digestion. When we are awake, our natural motions are sometimes interrupted by those which are voluntary; and the motion of the fluids is interrupted in some vessels, and retarded in others. In external actions the blood is wasted, and consequently does not flow through the internal parts so abundantly. In those parts of our bodies which are in motion, the circulation of the blood is very strong; and it is continually pressing the humours in the secretory vessels, whilst, on the contrary, it is so weak in others, that the chyle can scarcely be changed into blood. A sweet sleep re-establishes the equilibrium every where. The vessels are opened, the juices run uniformly, the heat is preserved; in a word, nothing is lost, and all contributes to the good of the machine. Hence it is that after a good sleep we feel rested, refreshed, strong, and vigorous.

Surely these circumstances should cause us to acknowledge the goodness of God towards us. What most merits our attention and gratitude is, that sleep is accompanied with universal stupefaction of the senses, which comes upon us insensibly, and which we cannot resist. The first of these circumstances makes it more sound and refreshing; and

the second makes it an inevitable necessity. What consummate wisdom appears in the regulation of the muscles when asleep! The first which stiffens is intended to guard the eye, one of the most precious organs, and which is most exposed to danger. The eye-lid closes of itself as soon as we grow sleepy and covers and protects the eye till we awake. In other parts of the body the muscles contract with more force, because their being relaxed might be inconvenient and even dangerous.

Let our sleeping, and, as I may say, unguarded hours, be always preceded with prayer and thanksgiving to God. And let our first thoughts be lifted up to him in the morning when we awake. Thus may we daily and constantly live in the fear of that God who is our preserver by night and day.

Aug. 5.

On the Divisibility of Bodies.

The perfume which plants and flowers exhale may easily convince us of the infinite divisibility of matter. How inconceivably small must the odoriferous corpuscles of a pink be, which diffuse themselves over a whole garden, and meet the sense of smelling every where! If this be not a satisfactory proof of this extreme divisibility, we may consider other objects which nature presents; let us examine, for instance, one of those silk threads, the work of a despicable worm. Suppose this thread be three hundred and sixty feet long, it will then weigh no more than a grain. Let us next consider into how

many parts a length of three hundred and sixty feet may be divided, even so as to remain visible to the naked eye. An inch may be divided into six hundred equal parts, each of which is the thickness of a child's hair, and consequently perceptible. According to this, each grain of silk contains, at least, 2,592,000 parts, each of which may be seen without a microscope. And as those parts may still be further divided into many millions more, a division which thought can extend even further, it is clearly evident that this progression may extend even to infinity. The last particles, which the art of man cannot separate, must still have extension, and consequently be capable of division, though we are not able to realize it.

If we examine the animal creation, we shall find other proofs of the infinite divisibility of matter. A great naturalist put pepper into a glass of water, and by means of a microscope discovered animalculæ a thousand millions of times less than a grain of sand! How inconceivably small then must be the feet, the organs of sense, the muscles, and the veins, of such an animal! What must their eggs and their young be? Here imagination is lost, our ideas, are confounded, though nothing be more certain than the above remarks. It is particularly worth observation, that the more we magnify by the assistance of glasses the works of nature, the more regular and beautiful they appear; while it is quite different in respect to those of art; for when they are examined through a good glass, we are amazed to find them so coarse, though they are finished with all possible care by the best workmen. Thus has God

impressed, even on the smallest atom, an image of his own infinity. The smallest body is a world, in which millions of parts are found united and arranged in the most perfect order. How wonderful is that wisdom which can operate in the little as well as the great, with so much regularity and perfection. How great that power which could draw such an infinite variety of beings from the depths of nothing!

O God! may these reflections teach me the narrow limits of my own understanding! The least insect may convince me, that there are millions of things of which I am ignorant, and cannot explain. Who can enumerate the parts of the body of an animalculæ, which is a million of times smaller than a grain of sand? Who can decide that degree of subtlety of one of those rays of light, several millions of which can pass throught a hole not larger than the eye of a needle? How soon is man lost in his ideas! How then can he be vain of his knowledge! How can he presume to blame the ways of the Lord, and find fault with his wise plans! Rather let us acknowledge our ignorance, and the infinite wisdom of God.

Lord, how great art thou! how marvellous are thy works! how stupendous thy condescension! What is man that thou art mindful of him? May thy glory be the great end of all my future actions! And at last may I awake up in thy likeness in that world where there is fulness of joy and pleasure for evermore!

Aug. 6.

The external Structure of Insects.

In general we judge no animals worth our attention but those which are distinguished from others by their bulk. The horse, the elephant, the bull, and such like creatures, appear to merit our attention, while we disdain to cast our eyes on the innumerable swarms of little animals which people the air, the vegetables, and the dust. How many insects do we tread under our feet! how many caterpillars do we destroy! how many flies buz around without exciting our curiosity! But how unreasonable is such inattention, for certainly divine wisdom and power are as manifest in the construction of a worm, as in that of an elephant, and the like. The body of most insects is composed of several rings, which link one within another, and have a part in all the motions of the animal. The essential character that distinguishes insects is, that properly speaking, they have no bones. And much wisdom is evident in this particular circumstance of their formation. The motions adapted to insects, the manner in which they are obliged to seek their food, and particularly the many transformations they go through, could not be well performed, if instead of those rings which move to and fro, their bodies were connected and fastened by bones. Several insects have a power of contracting or enlarging their heads; they can lengthen or shorten it, conceal it or show it, just as they please, or as occasion requires. The mouth of insects is generally provided with a kind of

trunk. This is necessary, both on account of their food, and the different pursuits they are exposed to. Some insects have no eyes, but they are made amends by the touch, or some other sense. Other insects have two sorts of eyes. Those which are smooth and bright are small in number; but the net-work eyes, like shagreen, the cornea of which is cut in angles, are very numerous. There are sometimes thousands of them. Though these be all fixed, this defect is supplied by their number and position. The horns with which most insects are provided, are of great use to them in their manner of life. These sorts of horns, by going before the body and feeling out the way, serve at once to warn the animal of the dangers it is exposed to, and to discover their proper food. The legs of insects are either scaly or membraneous. The former move by means of many joints; and the latter which are more simple, move every way. Often the same animal has both these sort of legs. Some insects have several hundreds of feet, but these cannot travel so fast as those which have only four. There is almost an infinite variety among insects with respect to this part of the body. With what astonishing art must the legs of those insects be constructed, which can fasten on smooth and polished surfaces! how elastic must the legs be of those which leap! and how strong those which dig in the ground!

Two, and sometimes four, wings are placed in the middle of their bodies. Some of these are as transparent as the finest gauze, and others are full of mealy scales. Some are without covering, and others are hidden in cases and sheaths. At the sides, or

the extremity of the body, there are orifices in the form of eye-lets, which are termed prints: they are the organs of respiration.

It would take the lives of many men to describe the different figures of these little animals. How varied are the forms of these little insects which fly, walk, leap, and creep. Still, however diversified their forms, we may observe in them a perfect harmony and proportion. How extravagant and perverse would it be, not to acknowledge, in all this, the wisdom and goodness of the Creator! A man is rational no further than he adores God in all things. O thou whom millions of saints and angels adore, may I never be silent in thy praise! May it flow for ever! for thou art worthy to receive honour and power. Amen.

Aug. 7.

A comparison between the Senses of Men and Animals.

Have not some animals more perfect senses than men? This question cannot be answered in the affirmative, except in some particular case: for in this respect also we must say of man, that he is more highly favoured than the rest of the creatures. It is asserted, indeed, that spiders have a finer feeling; and the vulture, the bee, and the dog, a much keener smell. By means of this the hound follows the hare, and other dogs are taught to find truffle under ground. The hog also digs it up with his snout, guided by his smell. Stags are thought to

have so quick a hearing, as to perceive the sound of bells several miles off; and the mole hears better under ground, than man who dwells upon the surface, and lives in open air. The eagle and the lynx have the advantage of man, in regard to sight. Notwithstanding the truth of these remarks, when we come to consider animals on the whole, and compare them with man, we must be struck with one great privilege given to the sons of men over a great number of the brute creation. Man is endowed with five senses; and this advantage is not given to one half of the animals. The zoophites which form the connecting link between the animal and vegetable kingdoms, have only the sense of feeling. Many have but two senses; others have three: and those which have five are reckoned the most perfect. But even the most perfect of them have not always senses more exquisite than ours. It is said that Indians can judge by their smell how much alloy is mixed with precious metals, as well as we can by applying the touch-stone to them. We are told that others can discover, at a great distance, the retreats of wild beasts. The inhabitants of the Antilla islands can distinguish by the smell whether a Black or a Frenchman has passed by. Thus the savages are in a manner compensated for the weakness of their intellectual faculties by the quickness of their senses. Some people have exercised and improved their senses to an astonishing degree; and if mankind were like the animals, without any other assistance to procure their food but their senses, and if reason was not their surer and better guide, no doubt they would have acquired the highest degree

of perfection, by exercising them to advantage. But man, in fact, has senses as fine as he wants; reason compensates an hundred fold for some advantages which certain animals have over us. Even if our senses were more keen, it would not be better for us. Had we, for instance, the sense of hearing as quick as the safety of animals requires theirs to be, even the most distant noise, and the stunning din of mixed sounds, would continually interrupt our meditations, our repose, and our most delightful enjoyments.

Adored be the wisdom of God, who has so measured the quickness of our senses, as to enable us to enjoy fully the blessings of his providence, without disturbing the noble occupations of human reason. The limited taste of our senses should be viewed rather as a blessing than a loss to us; a perfection rather than an imperfection. Happy the man who allows his reason to govern his senses, and who enjoys all the advantages which must result from a perfect harmony between them both.

Aug. 8.

The Thunder.

O MORTAL man! the thunder roars! Who is it that causes that terrible noise? Who is it that darts the lightning from the clouds? Behold, O sinner, it is the Ruler of the world! it is the arm of the most high God that hurls the thunder-bolt.

Nature reposes in his hand. He preserves and blesses it: but he shall one day speak, and at his

word the heavens and the earth shall be consumed by the flames: the heavens and the earth shall be no more! Careless sinner, what will then become of thee?

The thunder roars! how dreadful is the stormy sky! The lightning flashes! the thunder-bolt is shot! O God! how great art thou, and how terrible is thy power!

The Lord, from the height of his throne, frowns upon us: he causes the grave to open under our feet. When Jehovah acts upon the cloud, men and heroes tremble; the universe turns pale when he sharpens the sword of his anger.

God directs the thunder: the sinner hears and trembles. He dares scarcely lift his eyes towards him whose voice seems to threaten him with destruction. The majesty of thy God, O Christian, can bring no terror to thy soul. Thou canst exult in the midst of the storm. When the loud noise of thunder terrifies the ungodly, thy God watches over thee and guards thee from harm. Though he should deprive thee of life, all his judgments are just, and his ways are equal. He is thy God, and thou wilt say unto him: "Lord, my soul is at peace! all my "hope is in thee, whether I live or die!" The true believer is calm and easy, when the sinner flies at the sight of dark clouds. But where canst thou fly O sinner! Canst thou escape the all-seeing eye of God? In vain thou triest to hide thyself, the lightning pursues thee, and will find thee in the darkest recesses. Fly not then, O sinner, but rather humble thyself before God and beg for an interest in the atoning blood of the Lord Jesus. When the thun-

der roars thou tremblest, and strikest thy breast but when the tempest cease, thou returnest like the dog to his vomit. Forget not the vows which thou hast made in thy anguish and fright: remember God will not be mocked. What a man soweth, that shall he also reap. God is merciful towards the rebellious, but he will not spare for ever. God is just, and will call the sinner to account. What is the thunder roaring over our heads, in comparison of that day when we shall hear the sound of a storm, in which the elements shall melt with fervent heat, and the earth be burnt up?

AUG. 9.

Contemplations on a Meadow.

YE gloomy and majestic woods, where the fir-tree rears its stately head, and the tufted oaks spread their foliage; and ye rivers, which roll your silver waves through the grey mountains, it is not you I now mean to praise: the verdure and enamel of the meadows are now the objects of my meditation.

How many beauties now present themselves to my sight, and how varied are they! Millions of vegetables, and millions of living creatures! Some are flying from flower to flower, and others crawl in the dark labyrinths of the tufted grass: they all find food and happiness here, and are all perfect in their kind, however contemptible they may appear to us.

How the soft murmur of the limpid stream, which flows through the water-cress, intermixed with flow-

ers, which, bending over the water, trace their image in it. See that forest of waving herbs: what a mild light the sun pours on the different shades of green Those delicate plants interwoven with the grass, thus mix their tender foliage, or else proudly raise their heads above their companions, and display flowers without perfume; whilst the humble violet grows on barren hills, exhaling its sweets around. Thus we see the useful and virtuous man in poverty and rags, while the great and the rich, clothed in superb attire, consume in idleness the treasures of the earth. Winged insects pursue each other in the grass: sometimes they are lost in the verdure, and then again a swarm of them is seen flying in the air, and sporting in the sun-beams. What gaudy flower is that waving near the brook? How beautiful, and how lively its colours! I approach it, and laugh at my mistake. A butterfly flies off and leaves the blade of grass which bent under its weight. Yonder is an insect covered with a black cuirass, and adorned with brilliant wings: it comes buzzing to rest upon a blue bell, perhaps by the side of its companion.

What other buzzing is that I hear? Why do those flowers bend their heads so? Behold it is a swarm of young bees! They have left their home, and are dispersed over the gardens and fields. They are now gathering honey from the flowers, in order to carry it to their cells. They are none of them idle. They fly from flower to flower, and in seeking their stores they conceal their velvet heads in the cup of the flower, or else, with labour, penetrate into those which, as yet, are not unfolded. Yonder

on that high clover, sets a butterfly: he displays his gaudy wings, he settles the shining feathers that adorn his head, and appears proud of his charms. Beautiful creature! dost thou not resemble a young lady admiring herself in the glass which reflects her charms? The wings are more beautiful than her garment, but she is as thoughtless and giddy as thou art.

Behold this little worm running on the green turf! no researches of luxury, no human art could imitate the green and gold which covers its wings, which have a beautiful mixture of all the colours of the rainbow. How exquisitely beautiful is nature! The flowers and grass grow luxurious, the trees are covered with leaves, the gentle zephyr salutes us, the flocks seek their pasture, the bleating lambs skip and rejoice in their existence, millions of spires of grass rise up in the meadows, and on each point hangs a drop of dew. How many primroses are here assembled! how do their leaves tremble! how charming are the notes of the nightingale from yonder hill! Every thing in nature expresses joy. All things tend to inspire it. It reigns throughout nature. Happy he who, as a true Christian, passes a holy and innocent life in the enjoyment of the beauties of nature! The whole creation smiles upon him; and go where he will, joy and gladness are his attendants. Pleasures spring out of all surrounding objects, exhale from every flower, and resound in every grove. His mind is as serene as a calm summer's day: his affections are as pure and as gentle as the perfume of the surrounding flowers. Happy is the man who, in the beauties of nature, finds out

the Creator, and devotes himself wholly to him. Happy is the man whose God is the Lord!

Aug. 10.

Mischief occasioned by Animals.

It is distressing to see so many productions of nature exposed to the ravages of animals. Summer never passes without perceiving mischief, especially among the vegetables, occasioned by the rapacity of different kinds of birds and insects. How many trees are entirely destroyed, and fruits consumed by worms and caterpillars! The insatiate sparrow deprives us of many things necessary to our subsistence. How afflicting to see whole fields destroyed by rats and locusts! Such complaints as these are often made; and people are ready to think that certain animals exist only to torment mankind. There may be some foundation for these complaints. It is easier to destroy wolves, lions, and other wild-beasts, than it is to exterminate insects, when they swarm over a whole country. The chake, a sort of ant, is a real plague to the inhabitants of Peru. Even their lives would be in danger, if they did not use precautions to deliver themselves from these dreadful insects. But these and other similar inconveniences do not authorise such bitter complaints as we allow ourselves to make, especially when it is considered that most of our complaints proceed from self-love. We think we have a right to take away the lives of animals, either for our food, or for any other purpose; but we cannot bear that they should

deprive us of any thing. We expect they should contribute to our subsistence, and will give up nothing to them. But have we, in reality, more right over the life of a gnat than it has to a drop of our blood? Besides, in complaining of the variety of animals, we forget that this plan of nature is not so disadvantageous as it appears. To be convinced of this, we have only to consider the animal kingdom in the whole: such a species as appears noxious, is in reality of use; and it would be dangerous to endeavour to destroy it. Several years ago, some inhabitants of the English colonies in America endeavoured to extirpate the jackdaws, or jays because they thought these birds did much damage to the corn; but in this they were mistaken, for in proportion as they diminished, the people were struck with the havoc made by the enormous multitude of worms, caterpillars, and may-bugs. They soon ceased to persecute the jays; and as soon as those multiplied again, they put an end to this plague, which had been the consequence of their destruction. A project was formed some time ago, in Sweden, to destroy the crows, till they found that those birds were useful in destroying worms and caterpillars. The sparrow was violently persecuted in North America; but it happened from thence that the gnats increased to such a degree in the marshy countries, that they were obliged to leave a great deal of land uncultivated. So considerable is pheasant-hunting in the island of Porcido, that it occasioned the king of Naples to forbid the use of cats to the inhabitants: at the end of a few years the mice and rats increased so much, and did such mis-

chief, as to render the abolition of this order necessary. Why should we be so selfish as to envy creatures the little food that they require for their subsistence? We ourselves could not consume all the produce of nature. Instead therefore of giving way to unjust complaints, let us rather in this acknowledge the wisdom of the Creator. All the parts of nature are connected. No creature is useless, or created without design, though it may appear so to us. It is enough that they exist; we may rest assured that it is for the wisest purpose. If we are thoroughly convinced of these truths, all the works of the Lord will lead us to glorify and bless his name.

Aug. 11.

The variety of Colours.

If all things were of one colour, how dull and melancholy would the world be! The variety of shades, and colours, therefore, are proofs of the wisdom and goodness of God. If he had not designed to please us in an agreeable situation, why should every place around us be adorned with such a variety of beautiful paintings? The sky, and all the objects seen at a distance, are painted in the greatest stile: their characters are splendour and magnificence; lightness, delicacy, and the minute graces, appear in the objects intended to be seen near, such as foliage, birds, and flowers.

But whence is this distinction of colours? each ray of light appears to be simple, but by refraction

it is divided into several; and hence arise different hues. A glass filled with water, and set in the sun, reflects certain colours upon white paper; but angular glasses, well cut and polished, cast still more lively colours. If we turn a prism toward the sun, we shall see the finest rainbow close to us. According as the refraction of the rays is more or less strong, the colours will be more or less bright. The most refrangible ray is the violet, and consequently is the weakest. The nature, likewise, of the coloured bodies contributes to the variety of colours. In almost all bodies, the smallest parts are transparent: hence it is that they break, absorb, or reflect the rays sometimes in one way, and sometimes in another, after the manner of prisms. What shews, moreover, that colours are not inherent in coloured bodies is, that the neck and feathers of a pigeon or peacock, and even the stuffs called changeable taffeties, and silk, all change colour according to their position: this may give us some idea of the causes of such a variety of colours The whole may be reduced to this: the surface of all bodies is composed of extremely thin laminæ, which according to their thickness, reflect certain coloured rays, while they admit or absorb others in their pores. Thus when a body whose surface is smooth reflects and throws back almost all the rays of light, it appears white; and when, on the other hand, it absorbs them, it is black. Let us here admire the wisdom and goodness of God: were the rays not divisible, and were they not differently coloured all would be uniform, and we should not be able to distinguish objects only by reasoning. Our whole lives would

be taken up in study, rather than in acting, and we should be in continual uncertainty. Was there but one colour in the world, our eyes would soon be tired, and we should be rather disgusted than pleased with this dull uniformity. But the different colours which God has produced, serve to diffuse more beauty over the earth, and to afford a succession of new pleasures to our eyes.

Lord! thou art good, and doest good continually! All things around contribute to give us pleasure, and all ought to excite our gratitude!

Aug. 12.

On the Buildings of Beavers.

If a man who has never heard of the industry of beavers, and their manner of building their houses, were to see some of their edifices, he would, no doubt, suppose them to be the work of several eminent architects. Every thing is wonderful in the labours of these amphibious animals. The regularity of their plan, the size and solidity, and the admirable contrivance, of their buildings, must fill every attentive observer with astonishment. The beavers choose a place to build on where they can have plenty of provision, and near a rivulet, that they may have water to bathe in. They begin by making a bank or dyke, which keeps the water on a level with the first-floor of their houses. Sometimes the bank is a prodigious work: at the bottom it is about ten or twelve feet thick: it is formed entirely of wood and clay. The beavers cut pieces of wood

as thick as an arm, with astonishing ease. These they fix upright in the ground, very close to each other, and interweave between smaller and more supple pieces of wood. But as the water would get through, and their bathing pond would be empty, they have recourse to clay or potter's earth, with which they fill all the spaces within and without, so that the water cannot run through. They raise the dyke as the water rises. Having finished the bank of their watering-place, they begin their houses, which are round or oval buildings, divided into three stories, raised one above another. The lower one is generally filled with water; the other two are raised above it. They fix these little buildings in a very firm and strong manner, upon the edge of their watering place, and always by stories, in order to mount higher in case the water should rise. If they find a little island near their pond, they build their house upon it, which is then more solid, and they are less incommoded with water, in which they cannot remain long at a time. If they do not find this convenience, they, with the help of their teeth, put piles into the ground, in order to support their buildings against the wind and the water. They form two doors at the bottom, in order to go out in the water: one leads to their bathing-place, the other to the place where they deposit whatever is disagreeable from their upper apartments. They have a third door higher up, for fear of being taken when the ice blocks up the lower doors. Sometimes they build their houses entirely on dry ground, and make ditches from five to six feet deep, to go down into the water. They employ the same in-

dustry and the same materials for their building as for their dykes. The walls are perpendicular, and two feet thick. The ends of the wood, which go beyond the level of the wall, they cut off with their teeth: then mixing clay with dry herbs, they form it into a composition, with which they plaster both inside and outside of their work by the help of their tails which serve as trowels. The inside of the house is arched, and its size is regulated by the number of inhabitants that are to dwell in it. Twelve feet long, by eight or ten feet broad, is a space sufficient for eight or ten beavers. If the number be greater the building is enlarged in proportion.

The instruments the beavers make use of are four strong and sharp teeth, the two fore-feet, the toes of which are separated, the two hind-feet, the toes of which are connected with a membrane, and their tail, which is covered with scales, and formed like an oblong trowel. With these few utensils they shame our carpenters and masons, provided as they are with trowels, rules, squares, and axes. They cut all the wood they require for building with their teeth, with their fore-feet they dig the ground, and soften and mix the clay; their tails serve instead of a wheel-barrow to carry their clay or mortar, and afterwards as a trowel to plaster it on.

Thus the works of the beavers bear the greatest resemblance to those of men, and were we to judge by the first impressions they make upon us, we should suppose them rational, and that they acted from reflection. But were they capable of reflecting, they would build differently now from what

they did formerly, and make, as men do, continual improvements. But they always follow the same rules, and never go out of the lines prescribed for them by nature. They build the same kind of houses now that they did before the flood: but this does not render them less deserving of our attention and admiration, as they approach the nearest of all animals we know to human reason.

It is evident, from the observations we may make on beavers, that beasts are not mere machines, but that all their motions and actions are directed by a higher principle. Yet what a vast difference has the Creator placed between them in their faculties! The instinct of the beaver is far above that of the sheep; and what divine wisdom is manifested in these degrees, by which the brute creation insensibly draws near to man! Adored be that God that has given me reason! may I never degrade myself below the brutes by an abuse of it, but employ my faculties to glorify the Creator of all beings!

AUG. 13.

Animals considered as examples to Mankind of vices and virtues.

THE study of animated nature furnishes us with many pleasing ideas, especially as it gives us every where proofs of the wisdom and goodness of God: but we are not sufficiently attentive to the instructive lessons of morality it seems to convey. If man had never fallen, he must still I should think, have been capable of improvement. Life would have

been a state of trial, and of instruction; and it is natural to believe that the animals which it pleased God to bring before him, (that seeing different dispositions, they might call them by different names,) were intended to be his instructors as to the difference between good and evil, which in himself he would never have experienced, if he had not sinned.

It is remarkable, that compassion belongs to man alone. It is spoken of as it relates to God in a metaphorical sense: for God cannot be supposed to suffer with his creatures, as we do for each other. It is mercy in God, free and infinite mercy: in man it is compassion for all created beings. There is affection in the brute creation; but, properly speaking, there is no compassion. Certainly some animals, especially domestic ones, may teach us some virtues, and were no doubt intended to do so. The lamb may teach us a lesson of innocence; the obedient ox may teach us a lesson of submission; the ass is an example of patience; the horse of activity and aptness to receive instruction. The goat may teach us the value of liberty; the faithful dog is an example of fidelity and kind attention; and the cat of various domestic virtues.

Friendship seems unknown, or but faintly expressed among animals, excepting dogs and horses, and in them it is chiefly towards man.

Nothing of conjugal affection is seen except in the winged tribes. But parental affection is a shining quality in animals, at least in the female sex.

We should be particularly careful to avoid the vices of dumb animals. We should detest the glut-

tony, sloth, and filth of the hog. The dog, when fawning on his oppressor, is an object of contempt.

Such observations as these may be stiled common place; but while mankind remain inattentive, such things may properly be pointed out, and much more might be said, but I forbear. An attentive mind can never want an instructor. Every thing in nature will read some useful lesson. We should make spiritual improvements from occasional objects and occurrences. Thus says the royal Psalmist, "When I consider the heavens, the sun, "moon and stars, which thou hast ordained, what "is man, that thou art mindful of him; or the son of "man, that thou regardest him?"

AUG. 14.

Nature viewed in different points of light.

THE superiority of the works of nature to those of art, is observable in nothing more than in their admirable variety, which always furnishes new objects of pleasure and astonishment. We look a few times at a work of art, and then grow tired of it, and view it with indifference. But when we attentively examine and reflect upon the works of nature, the mind does not fatigue; they are always full of new charms, and we are loth to break off the contemplation.

Let us first consider nature in the most sublime point of view. We must be struck with astonishment, when we reflect upon the immensity of the

heavens, the inconceivable number of the stars, and the vast extent of the ocean. Compared with these all the works of art, however great and excellent, are insignificant and of no value. All the works of God are stamped with grandeur, which far surpass the idea and conception of mortals. What an idea of his infinity does the starry sky afford us! It displays the magnificent greatness of God more than all that the earth contains. What can be so much adapted to inspire our minds with the profoundest veneration for the Almighty, as the contemplation of these great works! With what ecstacy and religious fear should we feel ourselves impressed, when we view these great phænomena of nature, which no creature could produce, such as earthquakes, volcanoes, storms, and tempests! These grand scenes are sometimes exhibited before us, and there are none of them which ought not to make us feel the excellence and majesty of the Creator of all things.

We may next consider nature in a pleasing point of view. We behold the valleys adorned with verdure and beautiful flowers; fields promising rich harvests; hills covered with trees and vines. All these cheerful scenes present the Creator as the benefactor and friend of mankind, who openeth his hand, and satisfieth the desires of every living thing. This is the season when every thing furnishes the most striking proofs of his goodness. At present all things combine to flatter our senses, and to please and nourish us.

But the time will soon come, in which nature will shew herself under a gloomy form. It will soon be

stripped of much of its beauty and variety, and appear like a desert, which promises neither riches nor pleasure. This gloomy season gradually approaches, and the insensible decrease of the days already warn us that we must soon confine ourselves to our apartments. But even under this form, we should not be disgusted with nature; for the winter likewise has its share in the perfection of the world: and without it we should lose the pleasure of spring and summer.

Let us apply these reflections to our lives. They also are subject to variations, and are continually assuming new forms. Seasons of distress and sorrow often succeed those of pleasure and joy. In prosperity, therefore, let us prepare for adversity, and aim at the glory of God in every situation and action in life.

AUG. 15.

Damages sometimes done by Rain.

WHEN rain is moderate, it always contributes to the fertility and growth of plants; and therefore must be an inestimable blessing to the earth. But in various respects, rain may become hurtful to vegetables, when it either falls too heavily, or lasts too long. When it is too violent, it buries the small delicate plants: and when it lasts too long, it prevents their growth. When wet is excessive, it deprives them of the necessary heat, interrupts the circulation of the sap, and causes them to languish and sometimes to perish.

But this is not the only way in which rain becomes injurious, though it is the most common. It sometimes makes terrible havoc. When many clouds, driven by strong winds, meet with towers, or mountains, in the way, they burst, and suddenly pour out their contents. This must occasion terrible devastation: for, as water is very compressible, it must, when pressed down, run suddenly out, and fall with the greatest violence, from mountains and other heights. It is no wonder it should then sweep away large stones, tear up trees, and throw down buildings; for a two-fold cause renders its effects the more violent. On the one hand, the vast quantity of water: and on the other, its swiftness, increased by the height from which it falls: the action of a body which moves being always in proportion to its mass and its velocity.

Water-spouts are still more formidable: they resemble an inverted cone; the base terminates in the cloud, and their point is turned towards the earth. These water-spouts attract and draw up every thing they meet in their way, which is again dashed down more violently with the water. If the point of the cone touches the sea, the water boils up, foams, and rises with a most terrible noise; but if it falls on ships or buildings, it often sinks the former, and shatters and throws the latter down. Most probably this meteor is formed by the action of winds which blow in contrary directions, and which, meeting with many clouds in their passage, drive them with violence against each other. When these contrary winds strike a cloud sideways and necessarily give it a circular motion, which gives it the form of

a whirlwind, and their weight being suddenly increased by the force of pressure, they fall with impetuosity, and in their fall they take the form of a column, sometimes conic, sometimes cylindrical, which turns round its centre with great rapidity.

Cataracts and water-spouts are always dangerous: the latter, however, seldom take place at land, but are very frequent at sea. As to the cloud cataracts, the mountainous countries are most exposed to them; and they happen so seldom, that many years pass without an acre of land being destroyed by them. But some people are greatly affected by these effects; they view them on the darkest side; and their imagination magnifies the object. When a small corner of the earth (which is a mere speck in comparison of our globe) is laid waste by water-spouts, or any similar accidents, we complain, as if all nature was in danger of perishing, and forget the blessings we enjoy. But did we judge properly, we should be much more sensible of the general order and happiness resulting from the present plan of nature, than of the partial evils which are not in the common cause of things, and ought only to be viewed as exceptions to a general rule. How unjust and ungrateful is it to observe only storms and earth quakes, which happen but seldom, while we forget the hourly blessings which God is bestowing upon us! Let us never fall into such criminal and thoughtless ingratitude. We should rather reflect with humility and admiration on the works of God, and endeavour to form just and proper notions of them. For doubtless there is infinite wisdom, goodness and order, even in those things in which

we cannot discover the traces of them, but which will gradually unfold themselves to us, in proportion as we endeavour to study nature with an attentive and religious mind.

AUG. 16.

The care of Animals for their Young.

THE most remarkable instinct with which animals are endowed, doubtless is that which they shew in regard to the preservation of their young. Their self-love extends to their posterity, and that in the most solicitous manner, and in a way the most suited to their different species, and different kinds of life. Some of those little creatures which proceed from the eggs of fish, and insects, have no need of being hatched by the parent, as the heat of the summer is sufficient to animate and strengthen them; and they are capable of providing for themselves from the moment of their birth, if they are in a suitable place, and within reach of their food: but few insects live long enough to see their posterity. Fish and amphibious animals cannot distinguish their own young from others of the same kind: nevertheless, they are inspired with a knowledge of the best means to provide for the principal wants of succeeding generations. Gnats and other insects which are born in the water, but live either in the air or on the earth, never fail to lay their eggs where their young ought to be deposited. Insects which fly upon the earth, and which generally require no food for themselves, still take care to lay their eggs

on plants, fruits, flesh, and other substances which are proper to nourish their young. There are some which pursue other animals in order to insinuate their eggs into their skin, their hair, their mouth, or even their entrails: other animals which are helpless at their birth, are consigned to the care of their parents. How great is the anxiety of birds for their young, and even for their eggs before they are hatched. What a singular instinct is it in quadrupeds, to cut with their teeth the naval-string of their young, and that with such precaution as not to lose too much blood: with what tenderness they suckle them, guard them from all danger, and supply their necessities. The wisdom which appears in the instinct of animals can never be sufficiently admired, for the preservation of every species depends on the care which the parents take of their young:—it is their flesh and their blood: but that the oviparous animals should be solicitous about their eggs is very wonderful. The eggs are quite different in form from their parents, and in all respects are unlike any animals. And besides, the birds begin to build their nests before the eggs are visible, and the insect also seeks out places where the new generation may find subsistence before they lay their eggs

Adorable Lord God! open my eyes, that I may see and acknowledge more and more the wisdom that shines through all thy works!

Aug. 17.

Various kinds of extraordinary Rain.

Every phænomenon, however natural and useful it may be, is often a cause of terror to ignorant and superstitious people. This is evident from the rains which superstition considers as supernatural, and which terrify the ignorant multitude.

Who does not tremble when he hears of showers of blood? Sometimes, especially in summer, there falls a reddish rain, to which this name has been given; or rather they suppose such has fallen, when after a common shower the surface of the water appears red, or that some drops of that colour have fallen on the ground. Many people think that such a rain has fallen from the sky, and that it is properly blood; if so, no wonder it should be imputed to supernatural causes. There is nothing in it, however, but what is very natural: for the atmosphere being filled with different matter, and mixed with many foreign bodies, we must not wonder that rain should partake of this mixture. It may easily happen that coloured particles may fall with rain. The winds may raise up and scatter far and wide the coloured stamina of different flowers, and even the red excrement of certain butterflies. There are also small red insects on the surface of the water, which credulous people may take for blood. Sometimes a certain slimy humour, produced by fat reddish particles which float in the air, descend with the rain, as happened in Westphalia and other places, in 1764. But so far from

there being any thing wonderful in this, we may rather, be astonished, on the contrary, that these phænomena do not happen more frequently.

It is the same with showers of sulphur, which are reported to fall frequently. It is not properly sulphur, although it is possible that the atmosphere being full of sulphureous particles, some of them may mix with the rain. But it has been ascertained, from many observations, that those rains are nothing but flowers, or coloured seeds of plants, or small sand and yellowish dust, raised by the wind, and mixed with the rain.

The supposed showers of wheat are produced in the same way. When heavy rain falls in places where there grows much small celandine, it uncovers their roots which are very slender : the little scallions which adhere to them loosen and scatter about, and are supposed to be wheat fallen from the clouds, which superstitious persons consider as a sign of scarcity and famine.

But whence come all those caterpillars with which the gardens and fields are sometimes covered after a shower of rain has fallen? This is perfectly natural. The atmosphere containing various sorts of matter, it is probable that insects, with their eggs, should mix in it. The latter require only a place to be hatched in ; consequently when they are brought with the rain, they stick to the leaves, and there come to life. The possibility of this is proved by facts related by letters of the greatest probity. The rains which fall in Philadelphia during the month of August, bring insects with them, which when they stick to the human skin, and are not presently removed,

bite and produce great itching, and when they fall upon woollen cloth they remain in it, and multiply like moths.

Though many superstitions of this kind have been removed by naturalists, for which we owe them thanks, yet many of the common people in Germany are still full of them, and are a lamentable proof that men are more inclined to error than to truth, and that many of them remain ignorant of the goodness of God's government. Let us leave infidels and pagans to their follies and superstitions, but we, who have the happiness of knowing the true God, let us glorify him by faith, and trust in his wise and gracious providence.

Aug. 18.

On sensitive Plants.

We observe certain motions in plants which render it doubtful whether they have sensibility or not. There are vegetables, the flowers and leaves of which contract and shrink from the touch. Other plants open and close their flowers at certain fixed hours of the day, so regularly, as to mark the time very exactly. Others take a singular form in the night, and fold themselves up: their motions are the same whether they are in the open air, or confined in a close room. Those which always live under the water raise their heads above it during the times of seeding. The motions of a marshy plant which was discovered in the province of Carolina are still more singular: its round leaves garnished above, and on the edges are

a multitude of notches which are extremely irritable: when an insect happens to creep on the upper side of the leaf, it folds up, contracts, and shuts up the insect till it dies: then the leaf opens of itself.

We may daily observe certain regular movements in some of the plants in our gardens: when the weather is fair, tulips expand; but in the time of rain, and after sun-set, they shut up. Vegetables with husks, such as peas and beans, open their shells when dry, and curl up like shavings of wood. Wild oats, when put on a table, will move of themselves, especially if they have been warmed in the hand. And we may have observed the sun-flower, and some other plants, which always turn themselves toward the sun. These are facts obvious to every one. And hence it has been concluded that there was some sensibility in plants; and certainly the above circumstances seem to favour the opinion: but, at the same time there can be no other marks discovered of the sensibility of plants. Every thing in them appears absolutely mechanical.

We plant a shrub, and destroy it, without seeing any analogy between it and an animal. We observe a plant shoot, grow, blossom, and turn to seed, as we observe the hand of a watch run over all the points of the dial. The most exact anatomy of a plant does not discover any organ bearing the smallest resemblance to the seat of animal sensibility. Perhaps all we observe in regard to the motions of plants may proceed from the peculiar construction of some of their fibres, which contract and expand alternately; or, perhaps the subtle exhalation of

our bodies may cause the sensitive plants to shrink when we touch them. But it may also possibly be, that all nature being linked together, the first degree of sensation may subsist in certain plants, as indeed the step is very narrow between the plant and the muscle shell-fish. And this sensibility may extend even to what are termed sensitive plants.

Behold how limited is the human understanding on these subjects. All is conjecture. But let us rather rest in uncertainty than pass the bounds prescribed. However intricate the Divine plans, they are all dictated by unbounded wisdom and goodness. Enough is known to satisfy a reasonable curiosity. Let us endeavour to make a good use of the knowledge we have, without losing time in speculations more curious than useful. Something must be left for future ages to discover, and much more for eternity itself.

Aug. 19.

On the fear of Storms.

At a season in which nature presents only pleasing and delightful scenes, calculated to inspire the purest delight, there are still some persons to be met with who pass their days in complaints and murmurings. Summer, say they, would indeed be delightful, if storms did not come to disturb and banish all joy from the mind. The fear of storms and thunder is often founded on the opinion that they are the effects of God's wrath, and the ministers of his vengeance. If we generally consider that storms tend

to purify the air from many noxious vapours, and to fertilize the earth; and if we took proper precautions against the terrible effects of lightning, storms would cease to be so dreadul to us, and would inspire gratitude rather than terror. True it cannot be denied that thunder storms often do great mischief. Lightning often strikes men and animals, and sometimes has consumed whole towns and villages. Yet even here terror greatly magnifies the danger and the evil. To shew how unlikely it is to be killed by lightning, it is enough to know, that out of 750, 000 persons, who died in the space of thirty years in London, only two of them were killed by lightning. Observe likewise, that during the greatest claps of thunder most people prolong their fear unnecessarily. Whoever has time to fear the natural consequences of lightning, is already out f danger: it is the lightning only which is fatal When we have seen it without being hurt, and th thunder does not immediately accompany it, it is doubly foolish to turn pale and tremble at the sound of the clap, or shut our eyes for fear of a sound; which cannot possibly be dangerous. What ought to shorten our fears or prevent them entirely, is the consideration, that after the lightning we may wait for the thunder with the utmost safety, as it is certainly as harmless as the sound of a gun. The thunder in fact, tells us, we have eseaped the danger, and informs us at the same time, at what distance it is: for the greater the space of time there is between the flash and the thunder, the more distant is the storm.

The surest means to guard against the fear of

thunder, is to endeavour to preserve a good conscience. The righteous man, calm and composed, fears not the judgments of heaven: he knows that he is under the protection of the Most High, even when the wicked are destroyed. The God whom the Christian adores, commands the storm; therefore when he hears the thunder roar, he trembles not. He can rejoice in the midst of the tempest and the storm; he makes use of them to convince the infidel of God's existence, who dares to doubt it; and to bring terror into the hearts of the wicked. The people of God have no cause to tremble; it is their glory to love and put their trust in him, even in the midst of the most dreadful storm. After a few more rising and setting suns, they shall be raised above the stormy regions; they will then know more of the utility of storms, and more of the God that thunders: with one hand he holds the thunder, and with the other waters the earth; and thus at once shews himself both our Father and our Judge.

Aug. 20

The Summer furnishes us with the Images of Death.

When we surveyed our gardens a few weeks ago, we were surrounded by beautiful and pleasing objects, and every thing inspired serene delight: but the prospect now becomes daily less agreeable and less varied. The flowers are most of them gone: but these revolutions in nature are instructive lessons to us. There is a time of life in which we

have all the charms of spring; then we are admired and loved: and it is expected we should yield the most excellent fruit: but this expectation, alas! is often disappointed! the blossoms drop off even before they are blown—a fit of sickness robs us of all our charms, and a premature death puts an end to all our fond hopes. The spring flowers wither in summer, and are gone in a few hours. This is a striking emblem of death. Scarcely a day passes in which there are not some suddenly swept away, when they least expect it. It is true, that from habit we become almost indifferent to the deaths of so many of our neighbours as are suddenly cut off. Nevertheless, the days of man are as the grass of the field: in the morning it is green and groweth up, but in the evening it is cut down, dried up, and withered.

We have now reached that season in which we endeavour to avoid the scorching heat of the sun, and seek the cool shade of the grave. And even these retreats should lead us to reflect on the silence of the tomb. In the grave we shall find rest after the fatigue and heat of the day. There the wicked cease from troubling, and the weary be at rest.

The mower is about to cut down the corn. The fields will soon be stripped, and become like a desert. Here too we should remember our own lot. All flesh is as grass, and all the glory of man is as the flower of the field. Man flourishes for a little, and is then cut down when the Lord of the harvest commands. The bees may teach us this truth. When we reflect with what industry they collect and

prepare their honey, we should learn to lay up treasures of wisdom betimes, which may render old age comfortable, and death desirable.

In a little time the labourers will unite to collect the fruits of the earth. The days of harvest are the most solemn and important of any days in the year.

But O my God! how much more solemn will that great day be when God himself will be the reaper! when all the dead shall rise out of their graves; when the Judge of quick and dead shall say to his angels, "Gather the tares into bundles to burn "them, but the wheat into my garner." The righteous may meditate on this day of harvest with joy and gladness. Here "he goeth forth weeping, "bearing precious seed, but shall doubtless return "again rejoicing, bringing his sheaves with him." These are strong though not the only emblems of death which nature furnishes us. All who consider them, should look upon them as pictures of the shortness and frailty of human life; and we need not be afraid of having that comfort which summer affords lessened by such reflections as these. Meditations on death are the best means of improving this happy season, and make it still more agreeable than it is. When once we look on death in a proper light, it rather tends to ennoble and cheer the mind of a true believer, than to render him gloomy. Proper thoughts on this subject would induce us to make a right use of the bounties of Providence: would lead us to consider how fleeting all earthly things are; would support us under the miseries of life, and prevent our murmurs; would raise our thoughts above the bounds of time and the objects

of sense, and make us long to depart and be with Christ, which is far better.

Aug. 21.

The Causes of the Heat of the Earth.

The sun is certainly one of the principal causes of the heat of our globe; and the warmth of a particular place is owing to its relative position to the sun. When he is on the southern side of the earth, the inhabitants of the north have not such warm days as when he approaches the north. The same is observed in the southern parts of the earth, when the sun approaches the north. Between the tropics the cold is never so great as to freeze the lakes and rivers; on the contrary, the heat is always intense. When the sun continues long above the horizon, the heat becomes violent, for he then darts his rays some considerable time on the same place. For this reason the heat is great in some northern countries in the height of summer. Hence we must conclude, that the sun in its position, in respect to the earth, is one of the chief causes of the heat in open air. But if this was the only cause, all the summers would be equally cool; and the temperature of the air would be the same in all countries lying in the same latitude, which is by no means the case. It is observed, that on high mountains where there are spacious plains at the top, and on which there are other small hills, and other plains, it is still much colder than in low lands and deep valleys. Even under the line, if from a plain

where the heat is oppressive, we ascend a hill twelve thousand feet high, we shall find the sharpest cold and be even in the regions of snow and ice.

It has likewise been further observed, that in winter, when the cold has been very severe during the day, it has sensibly abated toward midnight, and the weather becomes temperate, though the sun's rays do not then warm the atmosphere. Hence it is reduced to a certainty, that there may be warmth in the air when the sun is not the immediate cause of it. Certain bodies, by friction and concussion grow warm and take fire. This is the case with axle-trees of wheels, when carriages run too fast, and have not been properly greased. Other substances warm and take fire when they are compounded. If a certain quantity of water be poured on a bundle of hay and straw, it will gradually grow warm Bodies which ferment or corrupt, often acquire a heat perceptible by the thermometer, and even by the feeling. Even in the air, the motion of certain matters may occasion mixtures, dissolutions, and combinations, which may produce a great degree of heat. And we may thus account for the production of heat in the open air. The sun certainly is the principal cause of it. And to the heat proceeding from him is united that of many living creatures; that of fire produced by wood, coals, &c.; that which comes out of the bowels of the earth, the bottom of the sea, and from warm springs. The heat is often much increased by the fermentation which different bodies undergo, whether on the surface of the earth, or in the higher atmosphere, and which produces hot vapours. When, therefore, all

sorts of little particles, such as float in the air, and are calculated to receive and retain heat; when they grow warm, and are carried away by the wind or rain, the heat gradually increases, and becomes more and more intense. On the contrary, when any of the above mentioned causes cease, it abates in proportion.

These plans are all worthy of the wisdom and goodness of God. They have also their use to all parts of the habitable globe; and God has assigned to all climates that measure of happiness of which they were susceptible. But we who live in a temperate climate, have cause for double thankfulness. We have a wise proportion of heat and cold, and if we do not praise God, (especially when we consider that we also enjoy the gospel,) the very stones would have reason to cry out against us.

Aug. 22.

Variety of Plants.

One of the things most worthy of our admiration in the vegetable kingdom, is the great variety observable in plants. They are varied in respect to their parts, their generation, their production, and their virtues. The manner in which fructification is performed in some plants is very obscure. We know little concerning its process in mosses, mushrooms, and ferns. There are plants which shew us singular montrosities. We see some flowers which have no tops; and there are some, out of the middle of which other flowers spring. Certain plants,

which are termed sleepy plants, assume a different situation at the approach of night. Others turn towards the sun, and others contract when we touch them. Some shut up, blossom, and bear fruit, sooner than others. All plants are originally wild, i. e. they grow without culture. God has assigned for plants a climate adapted to their nature and purposes, and where they should arrive at the greatest perfection. But those which are exotic, may be naturalized and made to succeed very well, provided care be taken to allow them that degree of heat which their nature requires. What is most pleasing to the eye, in plants, is their great variety of forms. We pass from the truffle to the sensitive plant, from the mushroom to the carnation, from the excresence of the cherry-tree to the lilac, and from the nashtoc to the rose-bush. If we consider the numerous sorts of mushrooms, or the kind of plants which we call imperfect, we must admire the fertility of nature in the production of those vegetables, which are so different in form from the others, that we can scarcely rank them amongst plants. If we ascend a few steps in the scale of plants, we see with pleasure the series of plants with stalks, from the most ordinary grass to the wheat which yields us such support.

We next observe the vast variety of creepers, from the tender bind weed to the vine. But in the midst of this variety there is the most perfect harmony. All plants, from the hyssop on the wall to the cedar of Lebanon, have some essential parts. A small herb is as perfect a plant as the most beautiful rose, and the rose is not less so than the finest oak

All belong to the same source, and follow the same general laws of growth, propagation, and multiplying; and yet each species is distinct from the other. Amongst all the millions of plants, every one preserves distinct characters and properties. What inexpressible riches in their colours, forms, and proportion. It is a happiness to be capable of observing this variety, and of tasting the many different beauties of the vegetable kingdom; but a far greater happiness is it to be enabled to contemplate the inconceivable beauties and ineffable glories of the Lord our righteousness, who died on the cross for the chief of sinners. He is the "Plant of renown! "the vine, the root, and the offspring of David! "the bright and the morning star! the fairest among "ten thousand, and the altogether lovely!

Aug. 23.

General Reflections on the Animal Creation.

The animal kingdom may be considered as a well governed state, where a proper number of inhabitants are found, and each in the place assigned him: all possess necessary faculties for their different avocations: they are induced to fulfil their appointments by rewards and punishments; and are sufficiently protected against their adversaries. In this animal republic, those which are small and feeble are in subjection to the strong; but the whole are in subjection to man, as the representative of the Deity.

The employments of animals are various: but all

tend either to the increase of their species, to maintain a sort of balance between the animal and the vegetable kingdoms, or to provide for their own subsistence, and to defend themselves against their enemies. All the parts of their bodies are adapted to their respective functions, and to the nature of their minds. Their instinct is a compensation for the want of reason. In each class of animals there are some which live on prey, and on the individuals which superabound in other classes. Each species has its peculiar enemies, and hence it is that none can multiply too fast, and a proper balance is kept up. The beasts of prey have a make conformable to their design. They are endowed either with peculiar strength, agility, industry, or address. But they are confined within certain limits, to prevent them from destroying a whole species.

The weaker animals are provided with defence in proportion to their situation and the dangers to which they are exposed. They are by various means preserved from destruction; and thus a proper balance is kept up, as to the number, in every species of the brute creation.

The animals which give milk are the largest, and consequently the fewest in number; but they fulfil very important offices. The other tribes of animals need not to be considered now; suffice it to say, that the existence of the whole proves the existence of God: a Being who possesses the highest degrees of wisdom and understanding. "His understanding is infinite! Who but he could have formed and furnished the world? Who but the Creator could give food to such an infinite multitude of

creatures, according to their different tastes, and find them clothing, habitations, and whatever else they require?

Yes, Lord God Almighty! thou only couldst do all these things! and to thee all the glory and praise belong. At thy feet, adorable Being, would I humbly prostrate myself, and pray for full, free, and everlasting salvation, through Jesus Christ, who died, the just for the unjust, that he might bring rebels back to God. When he shall bring up the people, may I be found among them. Amen.

Aug. 24.

On the Division of the Earth.

The whole known world is divided into four principal parts, Europe, Asia, Africa, and America. Europe is the smallest, for it is only nine hundred German miles in length, and 1,500 wide. Notwithstanding this, the Europeans possess countries in the other three parts of the world, and have subdued nearly one-half of the globe. The Europeans alone travel in the four different parts of the earth, and bring thence the productions of all countries. They are the most enlightened of all people, and cultivate the arts and sciences with the greatest success. Europe is generally cultivated; the inhabitants keep up a constant intercourse, and are nearly of the same religion. These remarks do not apply to the other three parts.

Asia, in size, is next to America. Its supposed extent, from the straits of Gallipoli, in the west, to

the eastern shore of Tartry is 4,800 miles; and its breadth, from the southern extremity of Malacca to the Frozen Ocean, is nearly 4,500. The heat and cold are extreme in Asia; and the earth is unfruitful in many places, and consequently never well cultivated. Many of the inhabitants are of a wandering disposition. In the morning they pull down their towns and villages to carry them some miles farther, and build them up again at night in an hour. It appears as if nature had made this wandering and unsettled life necessary, and intended that the establishment, laws, and government of these people, should be less durable, and more subject to change, than elsewhere. The other inhabitants of Asia suffer frequently from the unquiet and restless character of these wandering nations. The northern parts, which are full of lakes, marshes, and forests, have never been regularly inhabited; but the other parts are the finest countries in the world, and are wonderfully fertile, producing the necessaries and even the luxuries of life, in the greatest abundance.

Africa, next to Asia, is the largest part of our hemisphere, being a thousand leagues square. As it is under the torrid zone, there are immense sandy deserts, mountains of prodigious height, forests burnt up, and monsters of every sort found there. The utmost parts of Africa are still in a great measure unknown, though that part of the world is the nearest to Europe.

America is the largest division of the known world. It is divided into two continents, separated only by a very narrow isthmus, and surrounded by a great many islands. The cold climate of the northern

part is unproductive, and in a great measure unknown at present; but it appears from what is known, that the natives are uncivilized. The eastern coasts are cultivated by Europeans. There were formerly some great nations in South America: the remainder was inhabited by savages. On the whole, it may be said that America is the country of the greatest extent, but of the fewest inhabitants.

After all, what is our earth, taken in all its parts, when compared with those immense bodies which God has placed in the firmament! It is lost in the midst of innumerable worlds, like grains of sand in a great mountain. Yet the earth is a scene of wonders to us; and as we know but little of the worlds above us, let us act our parts wisely on that which we inhabit, that, through divine grace, we may be fitted for a better; where "the wicked cease from troubling, and the weary are at rest."

Aug. 25.

On the Nature and Properties of Light.

We feel every moment the rise of that light which is diffused over our globe, but we cannot, with certainty, decide the nature of it. All that the wisest men have said about it is conjecture. Perhaps it is a fluid substance, by which we are surrounded, and which, in order to be perceptible, only requires being put in motion by the sun, or some other fiery body: or it may be the fire itself, which, by the infinitely subtle particles issuing from it, gently strikes

our eyes at a certain distance. The most famous naturalists have adopted the first of these hypothesis. At least, it is certain that there is a great difference between fire and light; for light is beyond all comparison more subtle than fire. It penetrates glass, and other transparent bodies in a moment; whereas fire does it but slowly. Consequently the pores of glass must be large enough for the light to pass through easily; while the fire meets more resistance, because it is less subtile. Fire moves more slow than light. Let burning coals be put into a room, and the heat will spread but slowly, and the room will warm gradually; but the moment a lighted candle is brought into a room, it is immediately enlightened by it, and seen wherever its rays can reach. From these facts, and some others, it is concluded that fire and light are different substances, although we generally see them both together, and find that one may proceed from the other. Nevertheless, we may possibly draw some false conclusions from hence.

The nature of light is as wonderful as its properties and effects. How astonishing is the rapidity of its motion! If its velocity was not swifter than that of sound, it would take up seventeen years to come from the sun to us; but it only requires seven or eight minutes to do so. In that short space, as ray of light darts over many millions of leagues, and goes over 20, 000 in a second. Now as sound reaches only 10,700 feet in a second, a particle of light must be 786,000 times more subtile than a particle of air, although the latter is not visible to the naked eye, nor even with the best magnifying glasses. Besides

It appears from observations, that the rays of a fixed star, in order to reach us, must go further than a cannon-ball, shot with the greatest force, could go in the space of 104,000,000 years.

The extent, or expansion of light, is equally wonderful. The space in which it spreads has no limits but the universe itself, the immensity of which exceeds the capacity of the human understanding. It is by this almost unlimited diffusion of light that the very remotest of the heavenly bodies, in the solar system, become discernable even by the naked eye. Had we optical instruments which could extend our sight as far as the light can spread itself, we should be enabled to see bodies in the most distant extremities of the universe.

Our understandings are too limited to investigate the nature and properties of light; but we might explain many things, were we to give proper attention to them. For example: Why does light spread on all sides with such prodigious swiftness? if it be not in order that an infinite number of objects should come into view at the same time, so that thousands may look upon them at once? If the increase of rays acted more slowly, great inconvenience would result from it. Why are the particles of light so infinitely subtile, if it be not to paint even the most minute objects to the eye? Why are the rays refracted so many ways, if it be not to enable us to distinguish objects better?

Thus the Creator never loses sight of the gratification and benefit of his creatures. God is the Father of light, from whom cometh every good and perfect gift. What thanks do we owe him! espe-

cially when we consider that he has given his own Son to be a light to enlighten the Gentiles, and the glory of his people Israel.

Aug. 26.

The formation of Birds.

Birds ought, without doubt, to be ranked among the most beautiful creatures in the world. The wisdom of God may be seen in the form of their bodies. They, like other animals, have real bones, but are very differently clothed. Their bodies are covered with feathers fastened into their skins laid one over another in regular order, and furnished with a soft and warm down. Each feather has a quill with beards. The quill is hollow at the bottom, and thence the feather receives its nourishment. It is filled with a kind of marrow towards the top. Instead of the fore-legs of the quadrupeds, the birds have two wings. They are composed of eleven bones each, into which are set the feathers intended for flight. How admirable is the mechanism of the wings! They do not strike behind, like the fins of a fish, but act perpendicularly against the air which is beneath them, and which greatly assists their flight. That the wings may collect more air, they are a little hollow, and yet are so close, that no air can penetrate through them. The body is suspended between the wings in perfect equilibrium, and in a manner best adapted to the motions it is to perform. The heads of birds are small, that the weight may not hinder the vibration of the wings

and to be the more proper to cut the air, and pass through that element. The tail serves partly as a rudder, and especially to preserve the balance in flying, and to assist the bird in rising into the air, and descending again. Indeed the bodies of birds are formed throughout with such art and harmony as to be perfectly adapted to their way of life and their different wants. Each species is perfect in its kind, and no limb is superfluous, useless, or deformed. And besides, they are all beautiful and regular in their kind, and have each a beauty and regularity peculiar to themselves.

Thus even the sight of birds may become useful to us, if we accustom ourselves to trace them up to God that created them. It is well when we make this use of his creatures, and learn from the whole to adore him as their Creator. This we are sure of, "The saints shall mount up as on eagles' wings, "shall run and not be weary, and shall walk and not "faint."

Aug. 27.

Reflections on the Sky.

We have only to cast our eyes on the sky, to be struck with admiration at this magnificent work of God. With what lustre shines this rich canopy over our head, especially in the night when millions of stars appear, and when the moon sheds its mild light upon us! Who can lift up his eyes and contemplate this ravishing sight without astonishment, without the sweetest emotion? Often have I felt

it, and my sou. has been overwhelmed with an ecstacy of joy and wonder.

But we discover still greater wonders, when with the eye of the mind we traverse that immense space, and make it the subject of reflection. Where are the bounds of this space? Where does it begin, and where does it end? Worlds without number, of the most astonishing size, rise there one above another; and the mind that would attempt to follow them in their rapid courses, would soon discover its weakness. A pure etherial air, infinitely subtile fills that space, bears up those prodigious bodies, and traces for them the circles in which they continually run. This immense vault is not supported by props and pillars. It is no way supported nor fastened to any thing, and yet it has been borne up for near six thousand years! How astonishing the number and size of those celestial bodies with which the sky is filled! The size of the sun, and of many bodies moving round it, much exceeds that of our earth. The prodigious distance of the fixed stars makes them appear as little lights sparkling in the sky; but in reality they are so many suns, the great circumference of which none can measure. Most probably there are millions of fixed stars far beyond the reach of the best glasses We may venture to say, that many millions of suns and worlds roll in the firmament, and that our solar system is but the smallest part of that great multitude ranged above us in such beautiful order.

The above is marvellous. But to an attentive mind, the heavens present still greater wonders. Those bodies are in a perpetual motion, subject to

AUGUST.

"As the corn ripens for the sickle, so may we from day to day ripen for heaven."
Aug.t 28.th

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invariable laws. They all turn round their own axis, and many of them run immense courses round other globes. They never deviate from their respective paths, but run their courses with a swiftness which passes all imagination. They have a force by which they fly from the centre, and yet an equal force keeps them within their orbit. Though so many millions of bodies roll in this space, they never hit against, or incommode each other. Were we better acquainted with celestial worlds, we should find new subjects for admiration. But our knowledge is confined within very narrow limits.

Who can contemplate the sky without being struck with astonishment at the thought of the great Being who framed such magnificent works! Let our imagination lead us to humble ourselves before him, and to glorify his great name!

AUG. 28.

Moral Reflections on seeing a Field of Corn.

THIS field was lately exposed to great danger, but by the good hand of Providence it is preserved hitherto. The storms of affliction often threaten to overwhelm us, but having obtained help of God, we continue until now. It is true, that, like the weak ear of corn, we sometimes bend, and are bowed down to the ground; but God revives us again as the corn, and we grow as the vine. As the corn ripens for the sickle, so may we from day to day

ripen for heaven! May every event of life lead to this salutary end! May even the storms of life drive us into port! Those ears that are best filled with corn hang down the lowest. Just emblem of mankind! The vain and presumptuous, who have little or no religion, set themselves above others, and look with contempt on the righteous, who are lowly and meek. They are blinded by a foolish presumption, and despise the means of salvation. On the contrary, those who are rich in faith and good works, humbly bend down like the well-filled ears of corn.

Weeds and tares are mixed with this corn. Such is the situation of the Christian in the world: for a long time we observe in him a mixture of flesh and spirit, which are contrary the one to the other, so that he cannot do the things he would. A field of corn is also an image of the church at large. The tares and wheat are sown and must grow together till the harvest, i. e. till the great day of retribution, when God will give free course to his justice.

See how these reapers work! how fast they clear the ground! Thus death sweeps all away!—the high and the low, the rich and the poor, the saint and the sinner. But what does all this noise mean in the field? O! it is the sound of joy and gladness at the sight of an abundant crop. O that they were shouts of joy and praise to the Creator for his wonderful goodness! But how joyful shall the reighteous be at the great day of harvest! With what ineffable sentiments will their hearts overflow when they go forth to the supper of the Lamb, and to join

the blessed society of angels. May this sweet hope support us in the time of trouble, and render the hour of dissolution welcome! Amen.

Aug. 29.

On the Shell-fish.

Testaceous animals, or shell-fish, constitute a very considerable part of the animal kingdom. They live in a house of a substance more or less chalky, which may be considered as their bones. Their shells are either univalve, i. e. of one piece, or bivalve, or multivalve, i. e. of two or more pieces. They form two large families: the muscle, the shell of which is in several pieces; and the snail, whose shell is in one piece only, and generally spiral. The construction of the former is more simple than that of the latter. There is a great variety among shell-fish: some are oviparous, and others are viviparous. The shells appear to be formed by a slimy liquor produced by the perspiration of the animal, which gradually thickens and grows hard: but whether the shells grow by an exterior juxtaposition, or by inward nourishment in the ordinary way, is not absolutely certain. It is most likely to be the former means. Some shell-fish are carnivorous, and others feed on plants. Some keep at the bottom of the sea, and others on rocks, and remain motionless. Oysters, and other animals with hard shells, fasten themselves to different bodies, and stick to them by means of a sort

of glue, or chalk liquor, and are frequently heaped and fastened upon each other.

This adhesion is voluntary in some shell-fish, and involuntary in others; which always remain on the rocks to which they are fastened.

But our knowledge of these animals is still very imperfect, as they mostly live at the bottom of the water. Only three or four different classes of shell-fish are known at present; but could we examine the bottom of the sea, perhaps we might discover an hundred more. Neither do we properly know the purposes of their existence. They are however the work of God, and tend to display his glory.

AUG. 30.

The Government of God.

A GOD, who from his supreme elevation, could be an indifferent and idle spectator of all the changes which happen in the world, would not be worthy of our homage. Happily for us, the God whom we adore takes in all his creatures. We every where see the centre of his empire, but can no where find its bounds. All his works are continually before him. He sees at one glance the past, the present, and the future. Nothing escapes his notice. All things enter into the plan which he has formed to compass his designs. God takes pleasure in his works; with one glance of his eye he sees the whole, and rules them by a single act of his will The Ruler of the world makes use of inanimate be-

ings to preserve and support those that live, and to render them happy. He has also subjected them all to man, who alone is capable of knowing his works and adoring him.

This God, who is a God of holiness, commands all the children of men to be so too: he directs our actions to this end; and when the designs of his children are contrary to his merciful views, he renders them abortive. What wise measures he took in order to lead the children of Israel to Canaan! In vain did the idolatrous nations conspire their destruction. God still protected them. He punished them for their follies, and kept up among them that pure religion which he taught their fathers. Thus they were distinguished from the blind and superstitious nations around them.

But our God dwells in inaccessible light. No mortal can see his face, nor approach unto him and live: nor can any sound the depth of wisdom which there is in his government. Our understandings are too confined to penetrate into the counsels of an infinitely wise Being, or to discover beforehand the motives of his dispensations. The ungodly often prosper in the world, while the righteous are humbled in the dust; and yet there is a providence. Yes, God's tender mercies are over all his works, and he forgets not the humble. His dispensations are all adorable, however dark they may appear to us. Wonderful are his counsels. His plans surpass our understanding, but they are always formed and executed with sovereign wisdom. Whatever transpires tends to some excellent purposes. The afflictions and miseries under which some groan

may possibly have the happiest effect on their future state. The apparent evil is only a necessary medicine for the soul, and much more may depend upon it than is generally thought: whoever is discontented with his lot, let him reflect on all these things, and cease to murmur. Why, O man! wouldest thou wish to fathom those purposes according to which God governs the world? Thou canst never take in the whole chain of things which pass before thee. Thou knowest not what preceded, and what may follow; and yet thou wouldest presume to judge of causes and effects. The ways of the Lord are all right. Let us fall at his feet and say, Lord, here we are; do with us as seemeth good in thy sight, only do not destroy us for our iniquities; but bring us into thy favour on earth, and into thy presence in glory, where there is fulness of joy and pleasure for evermore.

Aug. 31.

Harvest Hymn.

Our fields crowned with blossoms and ears of corn, are a hymn of praise to Jehovah: the joy which sparkles in the eyes of the reapers, is a hymn to the God of nature. It is he who causes bread to spring out of the earth, and who loads us with his benefits. Come let us assemble and sing unto the Lord; let his praise be for ever the subject of our songs. Let us hearken to the words he speaks to us from the bosom of the earth. "The year shall "crown thee with its blessings. O world! thy

"happiness is my work. I have called forth the "spring; the crops and the harvest are the works "of my power. The rich pastures and the hills "covered with corn are mine." Yes, Lord, we behold thy greatness, and we feel the worth of thy favours. It is by thee that we exist; life and all its blessings are presents from thy hand. Blessed be thou, O field, which produces food for the children of men! Prosper thou beautiful meadow! Be clothed with thick foliage, O ye forests! God of nature, continue thy favours to us. Then, from the dawn of the morning to the close of the day, thou shalt be the object of our praise. Free from cares and anxiety, we will rejoice in thy benefits; and our children shall repeat after us. "The God of "heaven is our father in Christ! the Lord, the "Lord, he is God!

SEPT. 1.

On God's Omnipresence.

ALMIGHTY God, thou art every where present, by a boundless knowledge, by a general influence, and by an universal direction! Thou art here, and thou art afar off. Thou fillest immensity with thy presence. Here grows a flower; there shines a sun. Thou art here, and thou art there also. Thou art in the wind and in the tempest; in the darkness, and in the light; in an atom, and in a world. Thou hearest my weak voice, as well as the songs of angels who bow at the foot of thy throne. Thou art the God of the Seraphim, and

thou art also my God; and thou wilt hear us both. Grant that I may never forget my being in thy sight. May I think and act as I ought to do in thy presence; that when I shall be called to the tribunal of my Judge, I may not be obliged to fly from thy divine presence, through faith in my blessed Redeemer, may I stand there with acceptance, and hear him say, "Come, ye blessed of my Father, "inherit the kingdom prepared for you from the "foundation of the world

SEPT. 2.

The beauty and variety of Butterflies.

BEFORE these beautiful creatures die, let us examine them; Perhaps our observations will interest both our understanding and our heart.

The first thing that merits our attention is the dress with which they are adorned. Some of them indeed have nothing particularly striking in this respect: their clothing is plain and simple. Others have their wings a little ornamented, and some are entirely covered with ornaments. Let us confine our remarks to this last species. How beautiful are the shades which adorn it! how pretty the spots which set off the other parts of its dress! they are pencilled with consummate delicacy. But the beauties of this insect are vastly more striking when seen through a microscope.

Who would ever have thought that the wings of butterflies were garnished with feathers? And yet, in fact, nothing is more certain. What is generally

termed dust on their wings is in reality found to be feathers.

Their structure and arrangement are as full of symmetry as their colours are of beauty. The parts which make the centre of these small feathers, and are next the wings, are the strongest; and those which form the exterior circumference are much more delicate, and wonderfully fine. These feathers have all quills at the bottom, but the upper part of them is more transparent than the quills. If the wing be roughly touched, the most delicate part of the feathers is destroyed by it; but if all that appears like dust be rubbed off, nothing would remain but a fine transparent skin, in which we might distinguish the little cells or hollows in which the quill of each feather was inserted. This skin, from the manner of its formation, may be as easily distinguished from the rest of the wing, as we distinguish a fine lace from the linen to which it is sewed. It is more porous, more delicate, and appears as if embroidered with a needle. It is also edged with a fringe, the most regular and most exquisitely fine. What are our most elegant dresses in comparison with those with which nature has clothed the butterflies! Our finest laces are a coarse cloth compared to the delicate texture of the wings of a butterfly, and our finest thread would be as a rope. So great is the difference between the works of art and nature, when seen through a microscope. The latter are finished in all the perfection imaginable, the former, even the most beautiful of their kind, have no proper finish, are coarsely made up. How very delicate does a fine piece of cambric appear to

us! the threads are delicate, and the weaving is regular, and yet through the microscope those fine threads are like pack-thread; and we should rather suppose they were wrought by a basket-maker than come from the loom of a good weaver.

What is most astonishing in this beautiful insect is, that it comes from a worm of a very despicable appearance. See how this butterfly spreads its sparkling wings to the sun, and sports in his rays! How it rejoices in its existence, and flutters from flower to flower! Its splendid wings present us with the magnificence of the rainbow! How it is altered since the time when, in the form of a reptile, it crawled in the dust, always in danger of being crushed under foot! Whence is it that it can now fly? Who bestowed upon it those painted wings? It was God, who is its first Creator and ours. In this extraordinary insect he has given us an emblem of the transformation which awaits the righteous. A day is hastening, when, quitting their present form and mode of existence, they shall cease to grovel on the earth; then, all holy and glorious, they shall be raised above the clouds, and having nothing to obstruct their flight, they spring forward even beyond the stars themselves.

Sept. 3.

The growth of Trees.

Each tree, however rich its foliage may be, receives its chief nourishment from the root. And we have reason to believe that there is in it a circulation

of juices similar to the circulation of blood in the human body. The extremities of the roots are a prodigious mass of spongy fibres, and globules of air, but are always open in order to be filled with the juice they receive from the earth. This juice is at first nothing but water, impregnated with earthy particles, then by means of a kind of milky substance, which is peculiar to each tree, this juice acquires a nutritive quality. It is found by the microscope, that wood, notwithstanding its hardness, is nothing but a collection of little hollow fibres: most of them, particularly those of shrubs, rise perpendicular: but in order to give more consistency to these fibres, there are, in certain trees stalks which run horizontally from the centre to the circumference. Drawn by the rea of the sun, the juice gradually rises into the boughs and branches, just as the blood which flows out of the heart is conveyed through the arteries to the extremities of the animal body. When the juice has been sufficiently diffused through all the parts where it was necessary, what remains ascends by certain large vessels, placed between the outer and inner bark, just as the blood returns back through the veins. From this a growth results which is annually renewed, and it is this which causes the tree to grow thick. This we shall see if we only cut a branch across, by which we may tell the age of the tree. While the stem grows higher and higher, there is proportional increase in the root. As for the outer bark, it appears to be intended to serve, in some measure, as a sort of coat for the tree, also to unite closely the parts it is composed of, and to guard the tender parts from

accidents, and from the intense coldness of the air in winter.

Thus has the infinitely wise Creator formed an admirable system of solid and fluid materials, in order to give life and growth to those trees which adorn our fields, and afford shade to our flocks, our shepherds, and our cottagers, and which, when cut down, serve so many purposes useful to mankind.

We may, when we contemplate the works of nature, exclaim with the Apostle "O the depth of "the riches both of the wisdom and knowledge of "God! how unsearchable are his judgments, and "his ways past finding out!" The more we discover of the wise providence of God, the more we ought to trust in him, who has said, "I will never "leave thee, nor forsake thee!"

SEPT. 4.

On the Ant-Lion.

PERHAPS no insect is more dexterous than the ant-lion, although its form promises nothing extraordinary. It is something like the wood-louse, and is provided with six feet, and its body, which is composed of many membraneous rings, terminates in a point. Its flat square head is armed with two moving hooped horns, the singular construction of which shews how admirable nature is even in her smallest works. This insect is the worst enemy the ant has. He forms the most ingenious plans to catch his prey. He undermines a

a piece of ground, in the shape of a funnel, in order to remain at the bottom of it, and draws down any ants which may chance to come to the brink of this precipice. He digs it in the following manner: first, he traces the circular ridge in the sand, exactly the size of the funnel, the diameter of which is always equal to the depth he chooses to make it. When the size of this opening is marked out, he immediately digs a second ridge concentric to the first, in order to throw out all the sand inclosed in the first circle. All this he performs with his head, which resembles a shovel. He also takes up sand with one of his fore-feet, and throws it over the first ridge, and repeats this till he is gotten to a certain depth in the sand. Sometimes, in the digging, he meets with grains of sand rather large, or little bits of dry earth, which he cannot bear in his funnel, which he gets rid of by a quick well-measured motion of his head. If he finds still larger pieces, he endeavours to put them away with his back; and so earnest, is he in his labour, that he repeats it six or seven times. His trap thus laid, he places himself on the watch, quite still and concealed at the bottom of his funnel; he there waits for the prey which he could not pursue. If an ant come to the brink of the precipice, it generally falls to the bottom, because the edge goes sloping, and the loose sand, which gives way under his feet, draws down the poor ant into the power of his enemy, who drags him with his horns under the sand, sucks his blood, and there feasts upon him. When nothing but the dry carcase remains, he throws it out of the hole; and repairs his bank, if it has received any injury at the top.

This done, he places himself in amoush again. When the ant escapes, and endeavours to run up to the top, he works with his head, and throws up a shower of sand higher than the ant, which brings it again to the bottom of the hole.

There is such a wonderful art in all the actions of this little animal, that one can scarcely tire of examining him. He prepares the hole before he sees the ant destined to become his food; and yet his actions are so regulated, that they prove the surest means of providing for his support. In what other way could such a slow-paced animal as this catch his prey with so much facility? All his actions have fixed principles by which he is directed. His funnel ought to be dug in the sand, otherwise it would not be adapted for attracting his prey. According to the form of his body, he is obliged to work backwards, and to use his horns as tongs to throw up the sand to the top of the ditch.

The remarkable instinct of this insect discovers to us a first cause, whose foresight knew and ordained all that was necessary for the preservation and welfare of all creatures, even of the ant-lion. These reflections lead us to the great Creator of all things who has formed even this insect in such a manner, as to make its existence a blessing; and by its instinct, however limited, endows it in some respects with an ingenuity approaching to reason. Let even the ant-lion teach us to raise our thoughts to God, who has created the worm as well as the elephant, and extends his care equally to both.

SEPT. 5.

On the conformity between Plants and Animals.

IT is, perhaps, more difficult than is generally supposed to find out the specific difference between plants and animals. Nature descends, by imperceptible degrees, from the latter to the former, and it would require the penetration, of an archangel to distinguish the degrees exactly. But it may be remarked, that notwithstanding the difference between these two organized bodies, there still remains much resemblance.

The seed is to the plant what the egg is to the animal. A stalk springs from the former which had been concealed under the coats of the seed, and this stalk makes an effort to rise out of the ground. In like manner, the animal inclosed in the egg, pierces the shell in order to breathe the open air. The bud of the tree, in the vegetable kingdom, is what the embryo is in the animal. The eye does not pierce through the bark till it be of a proper size, and it continues attached to it, that it may derive nourishment from it, as well as from the fibres of the plant. At the end of a certain time the embryo comes from the womb into life; but even then it could not live long if it was not nourished by its mother. The plant feeds of nourishing juices which are brought it from without, and which passing through various canals, are at last changed into its own substance.

The fecundation of the germ takes place in the vegetable kingdom when the dust of the stamina penetrates into the pistils; so among animals fecun-

dation takes place when the seminal liquor penetrates into the ovaries.

Diseases of plants have either external or internal causes, and it is the same with the diseases of animals: finally, death is the common lot of the one as well as of the other. When old age has indurated and obstructed the vessels, the circulation of the juices is stopped.

Plants and animals dwell in the same places, vir. the surface and interior parts of the earth, the air, the sea, and rivers.

The size of the largest tree bears some proportion to the size of the largest animals. Thus one might be induced to believe, that plants and animals are beings of the same class; as nature passes from one to the other by such imperceptible gradations. It is very certain, that some general and essential resemblances have been found between them, and that no real essential difference has yet been discovered. Nature varies her works by such nice shades, that the human understanding has a difficulty in discerning them. Perhaps future ages may find out nearer resemblances between animals and plants.

Let us make that use of these discoveries for which all the truths of nature and revelation are designed, viz. to glorify God, and confirm our hope in him. Let us, when we consider the variety and perfection of the works of God, learn to be humble. Am not I more worthless and insignificant than the meanest plant? Am not I a degenerate plant of a strange vine? To Jesus I owe my whole advancement. If my nature be renewed; if the image of

God be impressed upon my soul; if I be an heir of God, and a joint heir with Christ? O how great are my privileges, and how strong my obligations to praise the Eternal! May I become holy and perfect; be free, and yet subject to my God; praise him for ever, and be eternally happy!

SEPT. 6.

On the Nature and Properties of Sound.

ALL sounds are produced by means of the air, but the air must be put in motion for that purpose. Not that the agitation of the air is the cause of sounds, for if so, every wind would be attended with a noise. The air must be suddenly compressed to produce a sound, and must dilate and extend again by its elastic power. This occasions a kind of trembling undulation, something like that of the waves and circles occasioned by throwing a stone into the water. But if this undulating motion was only to be effected by the particles of air being compressed, the sound would never reach our ears. It is necessary that the sonorous bodies, after making impression on the contiguous air, should continue that impression from particle to particle, in a circular direction to all parts. By this means the particles of air reach our ear, and we perceive a sound. This propagation takes place with prodigious velocity. Sound flies at the rate of 1,142 feet in a second. This circulation contributes to our security, as it informs us what distance thunder is from us, and tells us whether we be safe or not when we hear

it roar. By counting our pulse, or the beats of a watch, we may know exactly our distance from a thunder-cloud. By the same means the distance of ships may be calculated. But it is somewhat singular, that a weak sound propagates as quick as a loud one. But the motion of the air is proportionate to the sound. Of what use would these observations be, if our bodies were not so formed, that we might have the perception of sound? Should we not praise God, who has not only so disposed the air, that sounds, may be propagated by means of its vibration, but has also given us an organ by which we are capable of receiving sonorous impressions. A thin elastic membrane, stretched at the bottom of the ear like a drum, receives the vibrations of the air, by which means we have the power of distinguishing sounds. But if it be asked, how it is that, when we pronounce a word, it creates in us the idea of a word, and not a mere sound; or how a tone can act upon our souls, and produce so many different sensations, we can give no satisfactory answer to all this. It is necessary that this and every thing else should convince us of the wisdom and goodness of God. Were there no sounds, all mankind would be dumb, and we should be as ignorant as a child before it can speak; but by means of sounds, every one can express his wants and his enjoyments. In this respect man has great advantages; he can express the sentiments of his mind, and even excite the passions by certain tones of his voice. The Creator has not only endowed us with the faculty of distinguishing sounds by the organs of hearing, but has likewise furnished us with other means of

preserving this blessing. If one ear should be injured, the other may do its office, and the deaf may improve their hearing by the use of a trumpet. Still more, God has even vouchsafed to render this a circumstance of pleasure to us; a number of musical instruments amuse and delight us; our auditory nerves transmit to us, with great exactness, the tones of all sonorous bodies. When we consider the many obligations we are laid under, may our hymn of thanksgiving reach as far as sound itself; and the whole universe resound with praise.

SEPT. 7.

Mysteries of Nature.

WHEN men attempt to penetrate into the causes of the various effects that come under their daily observation, they are obliged to confess how weak and limited their understandings are. The knowledge we have of nature, of which we are sometimes so vain, extends but a little farther than a superficial acquaintance with the effects of a few things which we have constantly before our eyes, and which we are able in a certain degree to apply to our advantage. But as to knowing the cause of these effects, and how they operate, it is generally an impenetrable mystery. A thousand effects in nature are concealed from us, and even those which we can in some measure explain, have a certain obscurity which obliges us to recollect that we are but men. The immediate causes of many phenomena we know

not: several are doubtful, and there are but very few that we know with certainty.

We hear the wind blow; we experience its great and various effects, but we know not whence it cometh, nor where it goeth. We see a plant, with stalks and fruit, spring from a small seed, but know not how this is affected. As little can we comprehend how a plant can spring from a small kernel, which grows to a large tree, in which the fowls of the air may build their nests. All the aliments we use, though so very indifferent in their nature, are transformed within us by an incomprehensible mechanism, and assimilated to our flesh and blood. We behold the wonderful effects of the loadstone, and we think there must be a certain matter which operates in it, but who knows whether it acts by an attractive force peculiar to itself, or whether it circulates continually round the loadstone, and forms a kind of vortex?

We feel the cold; but where is the man that can tell what produces it? We know more than our ancestors did in respect to thunder; but what the nature of that electric matter is, which is so terrible in thunder-storms, no man knows. We know that the eye observes the images painted on the retina; that the ear has the perceptions of sounds by the vibrations of the air; but what are perceptions, and how are they formed? We feel conscious of having a soul in our body, but it is impossible to explain the union of the soul and body, or their mutual influence on each other. We constantly see the effect of fire and air, but are still ignorant of their real nature, or what are their integral parts, and how

their different effects take place. In a word, in respect to most things, we have no fixed and certain principles, and are reduced to take refuge in probability and conjecture. What are all the hypothesis of philosophers, but tacit confessions of their limited understandings? Nature, at every step, presents wonders which confound us; and thousands of objects arise which we cannot comprehend.

The mysteries of nature afford us daily lessons of wisdom, in regard to the mysteries of religion. In nature, God has placed within our reach the means by which we may go through life comfortably, although he has placed their causes out of our sight. Thus in the kingdom of grace he furnishes us with means of arriving at a spiritual life here, and an eternal life hereafter, though the manner in which they operate remains concealed from us. Who would refuse to eat and drink till he knew how it was that food would give him strength and preserve his life? Would it be wise not to sow nor plant till we had a just idea of the manner in which vegetation operates? Why do not men act as wisely in regard to the mysteries of religion, as they do in regard to the mysteries in nature? Men dispute about the way of salvation, and the doctrines of free and efficacious grace are a stumbling block; and neglect that use of means which God has furnished them with. O that we were as wise in spiritual as we are in temporal things! Instead of giving ourselves up to vain and useless speculations, let us avail ourselves of those means of grace which God affords us, and make a faithful use of them.

If we find things which we cannot comprehend, let us receive them with humility, and confess the weakness of our understandings. Never let us be vain enough to flatter ourselves with a perfect knowledge of all the mysteries of nature and religion, or rash enough to dare to criticise and blame them. It will better become us to confess our weakness and ignorance, and to adore the depths of divine wisdom. Where we cannot comprehend, let us admire

Sept 8.

On the eyes of animals.

The bare reflecting on the eyes of different kinds of animals is enough to convince any person of the wisdom with which God has formed the bodies of his creatures. He has not given the sense of seeing to all animals in the same way, but has varied the organs of it as best adapted to the different kind of animals.

The eyes of each animal appear round, but there is great variety even in its spherical form. Their situation in the head, near the brain, the most sensible part of the body, is also subject to many differences. Man, and most quadrupeds, have six muscles attached to each eye, by which they can move it from side to side. Such is the position of the eye, that they may look straight before them, and describe almost a semicircle. But even here we find a difference. Horses, cows, sheep, and hogs, have also a seventh muscle, to suspend and

support the eye-balls, which is necessary for them, because their head and eyes hang down, and incline towards the ground to seek their food. Frog's eyes differ from ours. They can cover their eyes with a membrane, which is transparent, though of a close texture. By this their eyes are defended and guarded from the danger to which their way of life exposes them sometimes living in water, and sometimes on land. Flies and gnats have sight to the greatest perfection. Their eyes are nearly as numerous as the holes in their cornea. While other animals with only two eyes are obliged to turn them by means of muscles to every object, the flies can distinctly see on all sides uninterruptedly, without having the trouble to turn their eyes; because some of these little eyes are constantly directed to the objects around them. Fish, which live in an element more dense than ours, could see nothing, and by the strong refraction of the rays of light would be blinded, though their eyes are well formed, and continually open, were not the chrystaline humour almost spherical in order the better to collect the rays of light. They have no eye-lids, and they cannot draw in their eyes, but their cornea, which is as hard as a horn, sufficiently defends them from all danger. It was not formerly allowed that moles had any sight, but it is now certain that they have two small black eyes, though not larger than the head of a pin. It was necessary that the eyes of this animal should be very small, and covered with hair, as it is generally under ground. The eyes of snails are placed at the end of two long horns, and they have the power to draw them in, or push them out, or raise them

above their heads, as occasion requires. In some animals, which can neither move their eyes nor their head, they are compensated by a multitude of eyes or in some other manner. Spiders have from four to eight eyes, all placed on the front of a round head, without any neck; they are as clear and transparent as a bracelet set in diamonds.

The cameleon (a species of lizard) has the singular property of moving one of his eyes, while the other remains still; of turning one upwards, and looking on the ground with the other; and of seeing what passes before and behind at the same time.

All these examples, to which thousands more might be added, are visible marks of the tender care of the Creator for the preservation of the most necessary organs of the senses. It has pleased him to convey the blessings of sight to his creatures in different ways: and we must be filled with amazement when we reflect on the admirable art observable throughout, and the precautions which have been taken to maintain creatures in possession of this precious organ, and to guard it from the dangers to which it might be exposed. The situation of the eyes in each animal could not be otherwise than it is, without great inconvenience resulting from it.

"Great and marvellous are thy works, O Lord! "yea, they are excellent, and sought out of all "them that have pleasure therein! Help me to "make a covenant with my eyes, not to look upon "evil!"

SEPTEMBER.

"Fish afford fresh proofs of the omnipotence and wisdom of God." Sep. 9.

Sept. 9.

On Fish.

If a man had never seen a fish, he could never have believed there were such creatures. If a naturalist knew no animals but such as walk and breathe on land, as the ox, &c. do, and was told that there were creatures in the water, so formed as to live, move, and multiply, and to fulfil every animal function with ease and pleasure in that element, would he not treat it as mere fiction, and, from the effects on our bodies when plunged in water, conclude it absolutely impossible to live in that situation? Certainly the way in which fish live, their construction, and motion, are truly wonderful, and afford fresh proofs of the omnipotence and wisdom of God. To enable these creatures to live in the water, it was necessary to form their bodies very different from those of land animals. This is the case with fish, both within and without. God has given to most fish a slender thin body, flattened at the sides, and always a little pointed at the head, in order that they should swim and cut their way better in the water. They are covered with scales, of a horny substance, that they may not be hurt by the pressure of water. Why are the bones of fish different from other bones, if it be not to render their bodies more flexible and light? Why are their eyes sunk in their head, if it be not to guard them from being hurt? It is clear that God, in the formation of those parts, has considered the way of life and destination of these animals. But there are more

wonderful circumstances still in their construction. The fins are almost their only limbs, and yet are sufficient to perform all their various motions. They move forward by means of the tail fins; the back fins direct the motion of the body. By the breast fins they raise themselves up, and that of the belly serves to balance them. They breathe at the gills which are behind their head. There are four on each side, the uppermost of which are the largest. They constantly swallow water through their mouths, which to them is the act of respiration, and they let it out at their gills. The blood which comes from the heart, and flows into the veins of the gills, does not return back to the heart through the lungs, as in land animals, but is directly dispersed through all the parts of the body. One of the organs most necessary to fish, in swimming, is the air-bladder in their belly, which communicates with their stomach. They make their bodies more or less heavy by means of this bladder. As it swells and extends, they become lighter, can raise themselves and swim to the surface of the water; when it contracts, and the air is thereby compressed, the body becomes heavier than the water, and consequently sinks down. Thus, if the bladder be pricked with a pin, the fish sinks at once to the bottom, and can rise no more to the surface.

The prodigious quantity of fish, together with their great variety of shape and size, is worth our admiration. There are above four hundred species of fish in Germany alone; and who can count the number of each species?

Their outward form is very much varied. The

very largest as well as the smallest o animals are to be found among fish. Some as long and small as a thread, others broad, short, &c. Some are armed with a horn, others with a kind of sword, and others with a saw.

Which shall we most admire, the power and wisdom of God manifest in forming these animals, or his goodness in giving them for our use? The whole must lead every attentive observer of the works of the Lord to magnify his name. What greatness appears in all the elements, in all the animals that inhabit the air, the earth and the seas! In the whale, whose back is as large as an island in the midst of the sea, and in the gold-fish which glitters in the stream! Let every thing that breathe praise the Lord Bless the Lord, O my soul

SEPT. 10.

The motions which belong to the Human Body and Mind.

THERE are three kinds of motions which every one may observe himself, if he turns his thoughts on such things. 1. Those that tend to the preservation of the frame, such as the motion of the heart, the circulation of the blood, the action of the stomach in digestion, &c. But we are not conscious of these different actions, unless the machine be disordered, when it is hinted to us by some pain or uneasiness.

2. The next kind of motions are those which we seem, as moral agents, to have command of, but over the performance of which we are conscious

we have no power or direction: such are all external motions, such as walking, speaking, handling; here the actions are directed by the will, and sometimes by a kind of mechanical habit.

3. The last sort of motions are those which are excited by our affections and passions; for these are really felt by the body, as pains externally applied; and they express themselves also on the body by outward signs. But we have no power to excite these motions, though we can in some measure conceal and repress them. I have, at least, a consciousness of their existence, as well as of my ability to perform their former motions, whenever the machine is in a state to act. If after all, any one should think that the whole is mechanism, and that matter may think, it is not in my power to convince him. Still it must be allowed that there is something within us that can think and know, wish and desire, rejoice and be sorry; which our bodies can hardly be supposed to be capable of. The great argument of the materialist is, that he who is supposed to act with freedom of will, is supposed to act without a motive. This, however, I must beg leave to deny. There is a motive in every man, viz. the desire of happiness, and consequently of existence. It seems to me more proper that God should be served by moral agents, than by those whom mere necessity directs. God makes his people willing in the day of his power; and when he changes the corrupt bias of the human mind, then he is adored with the purest motives, and with the perfect consent of the will. Indeed no service but that which is voluntary can be acceptable to him. The will of

man is not forced by God's knowledge and decrees, which, however, are fixed and certain. Notwithstanding this, sinners are voluntary in their vicious actions; and whenever we do any thing spiritually good and acceptable to God, it is in consequence of a divine change of the will, for "it is God that "worketh in us to will and to do of his own good "pleasure."

SEPT. 11.

The influence of the Moon on the Human Body.

CERTAIN influences upon the human body were formerly imputed to the moon, which were only calculated to raise superstition and groundless fears. Before the gardener would plant he must consult the moon; and the farmer deferred sowing till he was certain of its happy influences. Sick people attended with the most scrupulous exactness to the variations of the moon; and the physicians themselves paid attention to these in all their prescriptions. But these prejudices are greatly diminished of late years; and the empire of superstition, relative to the influences of the moon, is not so universal as it formerly was. This is one of the advantages the present age has over the former.

In regard to the influences of the moon on our bodies, the safest way is to avoid extremes: for as it would be irrational to attribute to that planet too great a power over the human body, so it would be no less rash to deny it any effect. In reality it must be allowed that the moon occasions great changes

in the air, and of course may produce some on the bodies of men. The moon causes such considerable alterations in the higher atmosphere, that earthquakes, winds, heat, cold, and vapours may result from thence. It is observed, that persons that have certain infirmities feel acerbations and pains more acute at the change and full of the moon. Nor is this any wonder: for if a change of air can influence our health, the moon has considerable influence over the animal economy, seeing she produces such alterations in the temperature of the air. Possibly there may be in the human body a flux and reflux, occasioned by the moon, analogous to that which is produced in the sea. Why do most periodical diseases return at the end of four weeks, rather than at a longer or shorter period, if it be not owing to the effects of the moon on the human body? It ought to be admitted, to the glory of God, that throughout all nature a certain connection is established, which may in different ways influence the animal economy: no doubt there are many wonders in the atmosphere which we are still ignorant of. And with respect to the moon, perhaps the light it affords us in the night is one of the least purposes for which this planet was formed. Possibly its being so near our earth was to produce certain effects on us, which could not be produced by the other celestial bodies, in consequence of their distance. At least, it is certain that every thing in the universe has relation, more or less remote, to our globe. This is what renders the world a masterpiece of divine wisdom. Let us then abandon all superstitious fears from our minds. If we be-

lieve that God is good, who has planned all things, and who has fixed the connection between all worlds, why should we indulge vain terrors, so contrary to the views we ought to form of divine wisdom? If we be really persuaded that this glorious Being governs all things with consummate wisdom and goodness, should we not trust in him, and rely continually on his wise and good providence?

SEPT. 12

The Ignis Fatuus

THE ignis fatuus, commonly called jack-a-lantern, or will-with-the-wisp, is a little flame which skips about in the air a few feet above the ground, and which appears to go hither and thither at random. Sometimes it appears to go out, (probably when it is concealed behind bushes,) but it soon rekindles in other places. Such fires are seldom seen in cold countries, and in winter they are only to be seen in marshy places. In Italy, Spain, and other hot countries, they are met with in all seasons, and neither wind nor rain extinguishes them. They are most frequently seen where there are putrified plants, and animal matter, as in church-yards, common-sewers, and in fat marshy ground. The precise nature of these ærial fires cannot be determined; but from the places where they are generally seen, may lead us to form some probable conjectures; for as they very seldom appear but in marshy countries, is natural to suppose them sulphureous vapours

which take fire. Putrid carcases and rotten plants are known sometimes to cast out light. Perhaps vapours condensed by the cold of the night, may take the appearance of ignis fatuus; or it may be the effect of a slight kind of electricity produced by the inward motions of the exhalations which float in the air. Horses and other animals may become electric, so as to cast out sparks of fire, when they are rubbed or put in motion in a particular way. And may not this be the case with some parts of the earth? May it not so happen, that a field, in some circumstances, shall be electrified in some parts and become luminous? The air itself may produce ignis fatuus, when it is electrified to a certain degree. If it be still doubtful how these fires are produced, it is certain they are the effects of natural causes. Notwithstanding this, the superstitious look on these flames with such terror, that few of them have courage to go near them. They imagine they are the souls of the dead, or wicked spirits, walking here and there, taking pleasure in leading travellers astray during night. What may have led to this superstitious idea, is the observing that the ignis fatuus follows all the motions of the air, and thus it may seem to fly from those who pursue it, and sometimes keep close to coaches, &c. that go swiftly. But the reason why it does so is very evident: for a person who runs after one of these lights, drives the air before him, and consequently the light follows its motions; whereas the person who flies leaves an empty space, which the ambient air fills up continually. Thus a current of

air is produced between him and the fire, and of course draws it after him. This is the reason why it stops when the person ceases to run.

How many people torment themselves by vain terrors, which have no other foundation than a disordered imagination. If we took the trouble to examine the objects which frighten us, we might spare ourselves many fears. The same things happen to us in a moral sense. With what avidity do men pursue the things of time, without recollecting that all is vanity! Most covetous and ambitious men are as unsuccesful in the pursuit of riches and honours, as Robert Flood was, who ran after the ignis fatuus, without being able to catch it. Earthly blessings generally escape those who pursue them, and riches, when acquired with ever so much care and anxiety, often make themselves wings and fly away.

Sept. 13.

On the Mineral Kingdom.

In order to procure wholesome and convenient dwellings, many materials are requisite; and most of these materials are shut up in the bowels of the earth, while its surface is left open for cultivation. When we want metals, stones, &c. we have only to dig a little way under our feet in order to find them.

Minerals may properly be divided into four distinct classes. The first includes fossils; that name is given to minerals which cannot be dissolved either in water or oil, and are not malleable, and which

bear the fire without losing any substance in it This class includes the simple earth and stones. There are two sorts of stones, the precious and the common. The latter are very numerous, and very different in form, size, colour, and hardness, according to the substance of which they are composed. There is also a great difference in precious stones. Some are perfectly transparent, and appear to be the most simple. Others are more or less dark, according as they are composed more or less of heterogeneous particles.

Salts form the second class of minerals. They include those bodies which are soluble in water, and which produce a relish on the tongue. They are divided into acids, which are sour and sharp; and into alkalies, which leave on the tongue a bitter, burning, and bixivial taste. These possess the property of changing all blue juice of vegetables, &c. into green. Natural salts are produced from an exact mixture of these two salts with each other. Kitchen salt is of this kind, and is produced from sea-water, or taken out of the earth. Salts are one of the chief causes of the vegetation of plants.

The third class of minerals include inflammable bodies which are called bitumens. If put into the fire they melt, and if pure will dissolve in oil, but never in water. They are distinguished from other minerals by the inflammable substance which they contain more than any other, and which render combustible the bodies they mix with, if the quantity be sufficient.

Metals are the fourth class of minerals. They are much heavier than the rest. In the fire they

become fluid, but resume their solid state when cold. They are bright and may be distended under the hammer. Some metals retain their weight though melted in the fire. This gives them the name of perfect metals. Of this sort there are three: platina, silver, and gold. The other metals, which are called imperfect, are destroyed more or less speedily by the action of the fire, and generally change into a calx. Lead has the property of being converted into glass, and of vitrifying also the other metals, except gold and silver. There are five imperfect metals, viz. quicksilver, lead, copper, tin, and iron. Platen, bismuth, nickle, arsenic, and zinc, are called half-metals, not being ductile.

The whole mineral kingdom is nature's great ware house, where she labours in secret for the good of the world. We have but an imperfect knowledge of the earth, especially with the inside of it. The deepest mines are not lower than 630 fathoms, which is not the ten thousandth part of the earth's diameter. This alone is sufficient to shew how impossible it is to have an exact and perfect knowledge of nature, and the formation of the different substances in the mineral kingdom. This, however, is of little cousequence: they manifest the glory of the Creator; and our happiness consists in knowing and enjoying him as our reconciled father in Christ Jesus.

Sept. 14.

Some of the principal exotic Plants.

We are not sufficiently attentive to the gifts of God, particularly those which come from distant parts of the earth, and are now, in a manner, become necessary. If we considered what trouble it cost, and how many wheels in the machine of the world must be put in motion, and how much human industry it requires to procure us a single bit of sugar, or cinnamon, we should not receive the presents of nature with so much coldness and indifference. Let us at present dwell on some foreign productions, which may now be considered as necessaries of life. Perhaps the reflections may be of use to us, and lead us, at least, to pity those unhappy slaves, whose indefatigable labours procure so many luxuries for us.

Properly speaking, sugar is the salt which is found in the marrow of a certain reed which is chiefly cultivated at Brazil and the neighbouring islands, but which is found in great abundance in the East Indies and in some of the African islands. Though the preparation of sugar does not require much art, it is extremely laborious, and is generally done by the slaves. When the canes are ripe, they are cut and carried to the mill, that they may be bruised, and the juice extracted from them. They first boil the juice which would otherwise ferment and grow sour. While it is boiling, the skim and dirt are taken off. This course is repeated in four differ-

ent caldrons. In order to purify and clarify it more, they throw it into a strong lye of wood-ashes and burning lime, and at last pour it into moulds, that it may coagulate and dry.

Tea is only the leaf of a shrub which grows in Japan, China, and other Asiatic provinces. These leaves are gathered three or four times during spring. Those that are first gathered are the finest and most delicate. This is the imperial tea, but it never comes into Europe: that which is sold under this name is only the second gathering.

Coffee is the stone of a fruit like a cherry: the tree which produces it is originally from Arabia, but it has been succesfully transplanted into severa. hot countries. We call the stone in the middle of the fruit the berry: when fresh, it is yellowish, grey or of a pale green, and it preserves this colour in some degree when dry. The fruit is spread on mats, and dried in the sun; afterwards it is bruised with rollers, to force out the berry, which is thus divided into two; then again they are dried in the sun, and prepared to be shipped to foreign countries.

Cloves are the buds, or dried blossoms of a tree, which formerly grew without culture in the Molucca islands, but which the Dutch have transplanted to Amboyna.

Cinnamon is the second or inner bark of a species of bay-tree, which grows scarcely any where but in the island of Ceylon.

Nutmegs and mace are the produce of a tree which grows in the Molucca islands: the nut is covered with three rinds; when the nut is ripe, the

first falls of itself, then the second appears, which is very thin and fine. It is taken off the fresh nut with a great deal of care, and exposed to the sun to dry: this is the mace. The nut is taken out of the shell, and put into lime-water for several days, and is then prepared and fit to send abroad.

Cotton grows in most parts of Asia, Africa, and America. It is the fruit of a sort of pod, which opens when ripe, and presents a wad, or lump of down, extremely white and delicate: this is called cotton. When this wad swells with the heat it becomes as large as an apple. The various uses of cotton are obvious to every one.

Olive oil is the expressed juice of the fruit of the olive-tree, whole forests of which are common in France, Spain, Portugal, and Italy. This oil is used instead of butter by the inhabitants of those provinces where these trees abound, as they have very few cows, the great heat of the earth preventing the growth of grass.

Pepper is the fruit of a shrub, the stem of which, requires a prop to support it: the wood of it is knotty, like a vine, to which it bears a near resemblance: it produces white flowers, whence the fruit grows in bunches, something like gooseberries, and each fruit bears twenty or thirty pepper-corns.

How rich are the bounties of the Lord how innumerable are his benefits! and how sovereign are his ways The miserable slave who is as worthy as we are to eat in peace and quietness the fruit of his labour, prepares, at the expense of his sweat and ease, those luxuries which we consume with so much profusion. May we daily praise and honour

that blessed Being who decks our table from all parts, and manifests his goodness towards us from all quarters of the globe

SEPT. 15.

Reflections on One's self.

I AM alive; my blood circulates through my veins, which are formed for that purpose with wonderful art, but I am insensible of the manner in which it was done. I can enjoy sweet sleep; and even in that insensible state my soul still exists: I awake, my senses resume their functions, and my soul receives clearer and more lively ideas. I eat and drink; and surrounded on all hands with mercies, I feel a thousand pleasing sensations. Am I the cause of all these effects? When I was plunged in the night of nothing, did I give myself existence? did I give being to the beauties of nature, or did they produce themselves? Surely I am fearfully and wonderfully made! surely I am surrounded with wonders!

My soul, imperfect and limited as it is, declares the greatness of that Being who formed it: a necessary Being, of infinite perfections, on whom I, on whom all things depend every moment. This body which I bear, and the construction of which I am ignorant of, shews that I must have a wise Maker, whose glorious greatness my limited understanding can never comprehend. There is no part of our bodies, however small and inconsiderable, for which there is not a sufficient reason, and which is not absolutely necessary, or which becomes so by the

connection it has with other parts. How infinitely great must my Creator be, since I am not alone, but millions of human beings, innumerable multitudes of animate and inanimate creatures exist as well as I, and seem to say to me with a loud voice, "Behold the Invisible! acknowledge him in all his works! behold his greatness and perfection displayed in us all! think on the most insignificant being, it lives as thou dost! Blessed be that God who has so wonderfully formed us!"

To thee, O God! the adorable author of my existence, I owe, and ever shall owe, eternal thanksgiving! In thee I live, and move, and have my being; it is through thy goodness that my soul thinks and reflects in a healthy body; by thy command all nature inspires me with joy; thou art he whom all creation should praise! I bless thy goodness, wisdom, and providence; and commend myself to thy paternal care! Thou knowest all hearts; thine eye is upon us, and thou regardest all our actions.

Thou directest events with so much wisdom, that even those which appear the most unfortunate, often contribute towards our happiness. All things work together for good to them that love thee. May the remaining hours of my pilgrimage, those hours that when once passed will never return, be spent in a manner worthy of my existence, so that when I come to die, I may arrive at still greater happiness, and be enabled better to explore the mysteries of nature and grace. May my present meditations, by the assistance of thy holy spirit, lead me to praise thee my God, thou Being of beings, for ever and ever. Amen.

Sept. 16.

The Strength of the Animal and Human Body.

Although the human body has more external delicacy than that of most animals, yet it is very strong, and perhaps more so in proportion to its size than any of theirs. For when the strength of a lion is compared to that of a man, it should be considered that this fierce animal being armed with claws, we are apt to form a wrong idea of his strength from the use he makes of them. But we may find a better method of comparing the strength of men and animals, viz. by the weight they can bear. Were it possible to collect into a single point the whole strength a man makes use of each day, it would be found that one of the least men would be able to lift a weight 1,728,000 pounds, a foot from the ground, every day, without hurting his health. People accustomed to hard labour can generally, without much difficulty, carry burdens of 150 or 200 pounds weight.

Those who are employed at the different quays in London, to load and unload ships, sometimes carry burthens which would almost kill a horse. The size of a man's body is in proportion to that of a horse as one to six or seven: therefore where the horse proportionably strong, it could bear from 1200 to 1400 pounds weight, which is altogether out of his power. A learned Frenchman made an experiment of the strength of the human body: he had a sort of harness made, by which means he placed on every part of the man's body, standing up, a certain num-

ber of weights, so that each part of the body supported as much as it could bear with the others, and every part was loaded as it ought to be: by this means the man could carry a weight of 2000 pounds, without being overloaded.

We may likewise judge of the strength of man by the continuance of his exercise, and the lightness of his motions. Men who are accustomed to hunting will outrun horses, or at least can bear the exercise longer; and even in walking, a man who has been in the habit of it will go further in a day than a horse can; and if he do not accomplish it the first day, he will be able to continue his journey many days without inconvenience, while the horses will be exausted with fatigue in a much less time. At Ispahan, couriers go near 130 miles in eleven or twelve hours. And it is said by travellers, the Hottentots can outstrip lions; and that the savages in America who hunt the elk, pursue these animals, though they are as fleet as stags, till they tire them out and catch them. A number of things are reported of the fleetness of the savages, and of the long journeys they take and accomplish on foot over the most rugged mountains, where there is no beaten path. It is said, that these men will perform journeys of 4 or 5000 miles in six or seven weeks! What animal, except birds, can perform such journeys as these? The civilized part of mankind are unacquainted with their own strength; and indeed they are so circumstanced, as to have no occasion for such extraordinary exertions.

Here again we must acknowledge the admirable wisdom with which our bodies are formed, to be

capable of such activity. At the same time, how much are those men to be pitied who pass their lives in idleness, sloth, and effeminacy, and who have not resolution enough to make use of their strength, for fear of hurting their health and endangering their lives. Why has the Creator given us strength, if we do not use it? Let us employ our powers to the glory of God, and for the good of mankind, according to the situation in which we are placed in the world; and if Providence calls us to it, let us "earn our bread with the sweat of our "brows." Even then we shall be far happier than thousands who are exhausted with pain and sorrow, groaning under the yoke of insupportable slavery, who, when worn out, have no means of relief, nor any rest from their oppression.

To what good purposes have we lived in the world till now? what have we done for the honour of that God who has bought us with a price, and made it our duty to glorify him with our bodies and spirits, which are his?

Sept. 17.

The instinct of the Butterfly, relative to the Propagation of its Species.

Butterflies begin to disappear at this season of the year, but the race is not extinct. This insect still lives in its posterity, and, by a most wonderful instinct takes care to provide for the preservation of its species. The eggs which it has laid will produce new generations; but where will it

deposit them at the approach of winter? Is there not great danger of their being frozen, or washed away? The Being who has given wisdom to man, has also instructed the butterfly how to secure in safety the only surviving legacy it leaves to the world, by pasting over its eggs with a gluey substance drawn out of its body: this paste is so compact and close that the rain cannot penetrate through it, nor can the severe cold of the winter kil the young ones contained in those eggs. But though each species always follows the same method from generation to generation, yet there is great variety in the measures taken by the different species of butterflies for the preservation of their young: some of these insects lay their eggs in the beginning of autumn, and then die; lying over, and turned to their dear offspring. The sun, whose power is still considerable, warms the eggs, and there come out, even before winter, a number of little caterpillars, which begin to spin immediately, and make themselves very spacious nests of their thread, where they pass the winter without eating, and almost without motion. It appears, when this retreat is opened, that what they spin serves for bed and covering.

All these things and many more of the same kind, are well calculated to cause us to admire the wise plans of an all-preserving Providence. If any thing but miracles, absolutely out of the course of nature, could excite our attention and affect our minds, the marvellous instinct of butterflies would fill us with astonishment.

Let us, who are rational beings, learn from the

above observations to preserve in our hearts a love for our posterity, and to interest ourselves effectually in those that are to come after us; nor should be discouraged in the schemes and projects we form, by the thought that death may overtake us before we have accomplished them. We should recollect what we owe to society, and that we ought, at least to take as much interest in what relates to posterity, as those who came before us did in what related to us. It is the duty of parents, in particular, to imitate the butterfly, in providing for their children, and to place them beforehand in as good and agreeable situations as they can. Let us who are parents take care not to render them miserable by our extravagance and bad examples, that they may not be our accusers at the bar of God.

Sept. 18.

On the Vine.

Some complain of the unevenness and inequalities of the ground, but if we reflect on the vine these complaints will become very unreasonable. The vine never flourishes on a flat, neither does every sort of hill agree with it, but those only which turn towards the south or east. Hills may be considered as the bulwarks of nature, which she invites us to cultivate as so many extensive walls for fruit, where the warm reflection of the sun unites with the fine open air to nourish them. Even the most barren hills, and those barren grounds that cannot be plowed, are every year covered with the most beautiful

verdure and produce the most delicious of all fruit. If the soil where the vine grows appear to be poor and bad, the plant which furnishes us with wine is not much better. Who would have thought that the worst of wood, the most shapeless and useless of any, should produce so valuable a liquor? and yet such is the fire with which the vine is animated, that the sap flows through it with six or eight times more force than the blood in the veins of animals. So great is the evaporation of the vine, that to supply what is exhaled through the leaves, 152 inches of sap must rise in the tree in the space of twelve hours! Who has endowed the vine with qualities so superior to the meanness of its origin, and barrenness of its native soil? Who gave it such fire and spirit that it may be preserved for several years, and it even improves by its age?

With what wisdom also has God distributed vineyards over the earth! They do not thrive every where, but require to be situated between forty and fifty degrees of latitude in the middle of our globe. Asia was originally the country of the vine, whence its cultivation has gradually extended to Europe: the Phenicians, who travelled very early over all the coasts of the Mediterranean sea, brought it to most of the isles, and to the continent. It succeeded well in the isles of the Archipelago, and was carried from thence into Italy. The vines multiplied greatly there; and the Gauls having tasted the juice, and wishing to settle in the places where the vines grew, passed the Alps, and went to conquer both the borders of the Po. In time vines were cultivated all over France, and at last on the borders of

the Rhine, the Moselle, and other provinces in Germany.

These observations may give rise to many important reflections. The most barren soil being fit for the culture of vines, it often happens that the poorest countries are favourable to wisdom and science. In provinces universally despised for their poverty, we have known geniusses rise up, who have by their wisdom enlightened other kingdoms. There is no country so desert, no town so small, no village however poor, in which certain branches of learning have not been cultivated with success: and how abundantly useful might we be, did we take a little pains to promote, as much as possible, the cultivation of the human heart. Kings, ministers, instructors of youth, how much might you contribute to the happiness of our fellow-creatures, and posterity also, were you, by rewards and exhortations, to endeavour to bring back wisdom, religion, and social virtue, into the ruined towns and villages! The appointed means are seldom used in vain, if used with proper motives.

The vine, with its dry and shapeless wood, is a just emblem of those, who, destitute of the outward splendor of birth and honours, nevertheless prove to be very useful. It often happens, that men who live in obscurity, and whose appearance promises nothing, are, notwithstanding, capable of actions, and perform enterprises, which raise them above all the great and noble among the children of men.

We may here reflect on the adorable Jesus himself; like the vine he was planted in a barren soil, has borne fruit, which shall ultimately by a blessing

to the whole earth. May I be a branch in this living vine, and bring forth fruit to the glory of God.

SEPT. 19.

The Wonders which God daily performs.

THE universe, which still subsists in all its beauty and its original splendour, as once established, is a constant miracle before our eyes. What a world is this which we inhabit! how great the number, the variety, and the beauty of the creatures it contains! What other hand but that of the Omnipotent could have placed in the heavens the sun and stars, whose size and prodigious distance from us confound our imaginations? Who could determine the course that they were to run for thousands of years that are past? Who has calculated so exactly the respective powers of all these globes? and who has established a perfect balance between them and the air which supports them? Who has placed the earth at so proper a distance from the sun, that it is neither too near, nor too far off? The vicissitudes of day and night, the revolutions of the seasons, the immense multitude of animals, reptiles, and trees, are all the works of God! If a world so admirable were now to be created before our eyes, should we not consider it as one of the grandest miracles of the Divine Omnipotence?

The particular providence of God is a constant proof of his infinite greatness, wisdom, and power. The continual care which God takes of men, and

his marked attention to each; the various methods he uses to bring men to himself, the paths by which he leads them to happiness, the trials he makes use of to awaken and bring them to the knowledge of themselves; and extraordinary events which he improves to the advantage of his government; events which are generally produced by small causes, and even by other circumstances which appear to render them impossible; the great revolutions he performs in nations, &c. to spread the knowledge of his gospel from one end of the earth to the other; these are so many effects in which we ought to acknowledge the ever active hand of God, and cry out with David, "This is the Lord's doing, and it is marvellous in our eyes!"

Let us only be attentive to all that passes before us, and we shall every where trace God: we shall find, that even by ordinary means he still acts for our good, and that we may continually hear his salutary voice. Men who see that God created this world, which exhibits such wonders; men who are constantly loaded with benefits, and indebted to him for all they enjoy, ought they not to believe in him, to love and obey him? But, alas, such is the total depravity of mankind, that they refuse to do it, and without the grace of God will not do otherwise. But this does not lessen the obligation: they ought to use the means and pray for the assistance of the Holy Spirit, which God has promised to them that ask him. When the heart is renewed by divine grace, what a prospect opens to the believing mind filled with admiration and astonishment at so boundless a display of mercy, he cries out, "Praise,

"honour, and glory be to God, who alone does "marvellous things! to the God of all grace and "consolation, to him be glory, through Christ Je- "sus, for ever and ever. Amen."

Sept. 20.

Digestion.

Digestion is a very wonderful and complex business, which we daily perform without knowing how, and even without giving ourselves the least trouble about it. Thousands of men take their daily food, and perhaps without ever having once considered what becomes of it when they have swallowed it. It is happy for us, that in order to digest well, it is necessary to know how it is performed; but still it is very desirable to know something about it.

After the food is chewed, ground by the teeth, and moistened, it is then prepared to pass in the œsophagus, or gullet. This the last action relative to digestion in which our wills have any part, for all the rest is formed without our knowledge, nor is it in our power to prevent it. As soon as any part of food is brought into the œsophagus, it pushes it by a mechanism peculiar to itself, and conveys it into the stomach, where its own weight would not be sufficient to carry it. In the stomach the food is reduced by some particular means into a soft paste, of a greyish colour, which, after being sufficiently attenuated, passes into the first gut, called the duodenum: in this the alimentary mass undergoes new

changes. Several small vessels which proceed from the gall-bladder, and from a gland situated behind the bottom of the stomach, called the pancreas, open into the duodenum, and empties the bile and pancreatic juice into it, which are there mixed with the food.

Besides these, there are many other glands in the intestines, which diffuse their humours through every part of the alimentary mass: it is after this mixture that a real chyle is discovered amongst this mass; and there is great reason to believe, that the digestion is completed and finished in the duodenum.

The alimentary mass continues its course through the other intestines, where it is continually moistened by the juices which are secreted in their cavities. The chyle then begins to pass into the lacteal veins, which open on every side into the guts, and then terminate into the reservoir of the chyle. This is situated in that part of the back where the first and second lumber vertebræ commence. From it proceeds the thoratic duct, which runs along the spina dorsi, and opens into the backside of the subclavian vein, near the outside of the internal jugular. The chyle flows through this canal, and in order to mix with the blood, it is received into the heart, and dispersed by the arteries and veins over the whole body, losing its white or greyish colour in its circulation.

This is a slight and imperfect sketch of the manner in which digestion is performed within us; a point so essential to our health, and even to our existence. Let us consider how evidently the wisdom of God appears in all this; how many as-

nishing circumstances must unite for this operation. It requires that the stomach must not only have an inward warmth, but also a peristalic motion, in order to reduce the food into a soft paste, and change it afterwards into chyle, which disperses through all the limbs of the body, and supplies them with blood and nourishment. A liquor called saliva is necessary, which possesses the properties of soap, and the virtue of mixing together watery and oily substances. It is necessary that, through the whole course which the food takes, there should be certain machines to separate from the blood many humours which are required for the perfect elaboration of it, and to render the chyle compleat. The tongue, the muscles of the cheek, the teeth, &c. must all concur to divide, grind, and attenuate the aliments before they descend into the stomach. What wisdom is here manifested! If we be inattentive to these wonders, we are inexcusable to the last degree. O God! all thy works praise thee, and thy saints bless thy name.

SEPT. 21.

The blessings of this life are greater than the evils of it.

MAN is born to trouble as the sparks fly upward; but nothing is better calculated to comfort the afflicted under the various trials which they meet with in this life, than admitting, as a fixed principle, that there is more good than evil in the world. Let us consult the most wretched of the sons of men, and

ask him if he can mention as many causes of complaint as he has motive for gratitude; however great his misfortunes may be, they are not equal to the multitude of favours he has received in the course of his life. To be convinced of this, let us only reckon how many days we have enjoyed health, and how very few we have been sick. To the few troubles and disappointments which we meet with in civil life, let us oppose the many comforts they have afforded: let us reckon all the blessings we remember to have enjoyed, and consider at the same time that we can recollect but the smallest part of them; let us be convinced that it is our being accustomed to blessings that makes us sensible of evils, that new prosperity causes us to forget the former; and that if the impressions of our sorrows are so deeply engraven on our memories, it is because they seldom afflict us.

Let us reckon the happy occurrences which we may remember, and which, by the way, make but a small part of the whole we have enjoyed; and let us oppose them to the evils we remember, the great utility of which we do not yet know. I do not now speak of those evils which, according to our own confession, have enhanced our blessings and proved very advantageous to us; nor do I speak of those little evils which have been the means of preserving us from greater ones, and which are designed to make us better and more happy: for such evils as these carry their own rewards with them. I only mean that we should oppose to the blessings which we recollect, those evils, the usefulness of which we do not know; and I aver, that if we make

this computation with coolness and serenity, we shall be fully convinced that the blessings we enjoy in this world vastly overbalance all the evils we meet with.

Why then should we think so little of the continual proofs we receive of the goodness of God? Why should we wish to look always at the gloomy side of things? Why should we torment ourselves by unreasonable cares and anxieties? Does not Divine Providence surround us with mercies and pleasing objects. Why then dwell always on our infirmities, on what we have not, and on the future ills that may happen to us? Why magnify them in our fancy, and perversely turn our eyes from our mercies, that might make us easy and cheerful? The least distress fixes our whole attention, while we overlook the blessings that are heaped upon us. Let us, however, endeavour to banish opinions that would make us wretched: we have no just cause of complaint, but on the contrary, a thousand reasons to call upon our souls, and all that is within us, to bless and adore the Supreme. Blessed, therefore, be the Lord, who fills our hearts with joy and gladness! If he afflicts us with one hand, he upholds us with the other. In heaven, eternal and unclouded happiness is laid up for them that love him; and he will lead them in the right way, that they may go to a city of habitations. Even the afflictions which he sometimes sends have the most merciful views, which they shall one day acknowledge. He will guide them by his counsels and afterwards bring them to glory.

SEPT 22.

On the enmity of Animals.

THERE is a constant war among animals, and every element is to them a field of battle. The eagle is a terror to the inhabitants of the air; the tiger lives by slaughter upon the land; the pike in the waters; and the mole under the ground. It is hunger that induces these and other animals to destroy each other; but there is a particular enmity between certain creatures which does not proceed from the same cause; for example, it is manifest that the animals which twist themselves about the elephant's trunk, and never give over till they have stifled him, do it not in order to procure themselves food; when the ermine leaps up and fixes itself to the ear of the bear or the elk, and bites them with its sharp teeth, it cannot be said that these hostilities are occasioned by hunger. Besides this, there is not an animal upon earth, however small, that does not serve for food to others. To some this plan of nature seems cruel and wrong, but I will presume to assert that this very antipathy among animals is an excellent proof that all is for the best: if taken in the whole, it is certainly an advantage that some should subsist on others; for if it were otherwise, on the one hand, a great number of species of them would have no existence; and, on the other, those numerous species instead of being injurious, are useful to the others. Insects, and many reptiles, feed on carrion; others fix themselves in the bodies of certain animals, and feed on their flesh and blood,

while they themselves are food for other creatures. There are some species which multiply so very fast, that they would become oppressive were not this increase interrupted: that formidable creature, the crocodile, would multiply to an alarming degree, did not the ichneumon seek and devour its eggs.

A large proportion of the earth would be desert, and many species of creatures could not exist were there not carnivorous animals: it may be said, that they would feed on vegetables; but if this was the case, our fields could scarcely produce herbage enough for sparrows and swallows. There is also reason to suppose, that animals would lose much of their vivacity and activity, were it not for the continual wars among them; creation would be less animated, beasts would become stupid, and man would lose a great part of his activity; and, in a word, many striking proofs of the wisdom of God would be wanted, were there an universal peace among animals; for the cunning, sagacity, and wonderful instinct with which they lay snares for, and surprise their prey, sufficiently point out the wisdom of God. Thus the glory of divine wisdom shines with double lustre even in this plan of nature. We might indeed complain, if an entire species were destroyed; but this is not the case; and the constant war among them is on the contrary, what preserves the equal balance: and the carnivorous animals are indispensable links in the chain of beings; but, for this same reason, their number is small in comparison of useful animals. It is likewise remarkable, that the strongest and most noxious of them have generally the least skill or cunning.

They mutually destroy one another, or they become a prey to others: and hence God has endowed the weakest animals with great industry, and they have many ways of defending themselves.

What is more wonderful, and most of all to be lamented, is, that among mankind we should behold continual and destructive wars. Alas! it must be confessed, to the shame of humanity and Christianity, that there are among men fierce and cruel destroyers, with this difference, that their hostilities are more frequent, and that they often make use of more dark and secret means to destroy one another. Lions, tigers, and vultures, are doves when compared to man. Let all Christians imbibe the spirit of Christ; let them endeavour to live in peace and harmony; let animals void of reason, hate, persecute, and destroy one another; but "let the same "mind be in us which was in Christ Jesus."

SEPT 23.

On the Moral use of Night.

THE days are gradually growing shorter, and the nights longer. Some are not contented with this plan of nature: perhaps they secretly wish that there was no night, or, at least, that they were all the year round as short as in the month of June. But these are unreasonable wishes and betray our ignorance. Were we to reflect on the advantages of the night, as it interrupts the course of most vices, or at least of those most fatal to society, we should be induced to bless God for his wise appointment.

Darkness obliges the wicked man to take some rest, and gives some hours of relief to oppressed virtue. In the night-time the unjust and fraudulent tradesman ceases to deceive and cheat his neighbour; and darkness puts a stop to a thousand disorders. If men could but be awake twice as long as they are, to what a degree would wickedness increase! In yielding to vice, without interruption, they would acquire a horrid familiarity with sin. In a word, it may be allowed, that the longer the nights are, the fewer the crimes that are committed: and this must be considered as one great advantage gained from the night. Were there no night, we could have no pleasure in contemplating the starry-heavens. In them we may behold, each clear night, the greatness of God. If whatever reminds us of God be desireable, how should we love the night, which so forcibly proclaims his perfections! were we to make this use of it, no night would appear long; but all nights be beneficial to us. One night's reflection on the works of God, might have a salutary effect on our whole lives. Let us contemplate attentively the immense display of his wisdom: if one single good thought be inspired, it may be of the greatest benefit to our minds. The night is generally a happy time for those who love to reflect and meditate. The hurry of the day seldom leaves but little time to recollect ourselves, to wean ourselves from the world, or seriously to think of our duties; but the tranquillity of the night invites us to these useful employments, and renders them easy to us. Then we may, without interruption, commune with our hearts and acquire the most im

portant knowledge, namely, the knowledge of ourselves. The mind may collect its forces, and direct them towards objects which concern our eternal happiness. Then the ill impressions we may have received should be banished, and our minds strengthened against the seducing examples of the age. It is the moment for reflection and death, and the great consequences of dying. The quiet solitude of the closet is favourable to serious reflections, and inspires us more and more with a desire to indulge them.

Sept 24.

Why are we so indifferent to the Works of Nature?

An answer to this question may give rise to many important reflections. Doubtless one cause is inattention: we are so accustomed to the beauties of nature, that we forget to admire that wisdom, the impress of which they bear; and are not so thankful as we ought to be for the innumerable advantages which we derive from them. Too many people resemble the stupid beasts, who feed on the herbage of the field, and quench their thirst at the stream, without ever reflecting whence proceed the blessings they enjoy, and without acknowledging the divine goodness in bestowing them. Thus men, though endowed with reason, seldom think of the source whence their mercies proceed: habit renders them insensible and indifferent, instead of exciting their admiration and praise.

Ignorance is a second cause of this indifference in many people: thousands are wholly unacquainted with the most common phænomena of nature: they every day see the sun rise and set, and the rain and the dew descend upon their fields. The most astonishing revolutions happen in their view every spring, but they do not take the trouble to inquire into the nature and causes of these phænomena, in respect to which they live in the most profound ignorance. True it is, that the wisest of men cannot comprehend all the mysteries in nature; but yet we may acquire, at least, an historical knowledge of it; and even the ploughman may comprehend how it happens that the seed he sows in the ground shoots and springs up, if he will take the trouble to inform himself of it.

The works of nature are disdained by others, because they are wholly employed in their own private interests. They would observe nature more attentively, if the spider spun threads of gold, if lobsters contained pearls, or if the flowers of the field could make old people young. We generally value things according to our interest or fancy. So unreasonable is our self-love, and we know so little of our true interest, that we despise the things which are of the greatest use: corn, for instance, is most indispensibly necessary to our subsistence, and yet we see whole fields covered with it, without paying proper attention to it.

Indolence prevents many people from contemplating nature: so fond are they of ease, that they cannot take a few hours from their sleep to contemplate the starry heavens: they have not suffi-

cient resolution to see the sun rise: they cannot bear the fatigue of stooping towards the ground, to observe what admirable art may be seen in the formation of the grass; but the same people are full of zeal and activity when the indulgence of their passions is the object. It would be almost martyrdom to the intemperate man, or to the gamester, to be obliged to devote to the contemplation of the heavens the hours he used to pass in gaming and drinking.

Others neglect the works of God in nature through an irreligious principle. They have no desire to know the greatness of God, for their hearts are at enmity against him. To praise and love God, and to bless him for the benefits they enjoy, would be painful and disagreeable duties to them. This perhaps is the principal cause of the indifference of mankind to the beauties of nature: did they value the knowledge of God above all things, they would eagerly embrace every opportunity of improving and increasing that knowledge. Perhaps three-fourths of the civilized world may be ranked amongst those I have now mentioned. How few are there that properly study, or take a real pleasure in the works of God! we have daily proofs of this lamentable truth. Have we eyes, and shall we not contemplate the wonders that surround us on all hands? Have we ears and shall we be still deaf to the hymns which every part of the creation chant to the praise of the Creator?

Sept. 25.

On several Nocturnal Meteors.

When the weather is pretty serene, we often observe a circular light, or large luminous ring round the moon, which is called halo, or crown: its outline has sometimes the faint colours of the rainbow. The moon is in the centre of this ring, and the intermediate space is often darker than the rest of the sky: when the moon is full, and much above the horizon, the ring appears more bright. It is often very large; but we must not think that it is really round the moon. The cause of it must be sought in our atmosphere, where the vapours occasion a refraction of the rays of light, which penetrate through them, and produce this effect.

There appear sometimes round, or on one side of the real moon, some false ones, which are called mock moons: these appear as large as the moon, but their light is paler; they mostly have circles, some of which are coloured like the rainbow, whilst others are white, and some of them have long and luminous tails. These, likewise, are but illusions produced by refraction. The light of the moon falling on watry and other frozen vapours, refracts in different ways, which reaching our eyes, doubles the image of the moon.

Sometimes, though but very seldom, we see in the night a lunar rainbow, with the same colours as the solar, only they are not so strong. This meteor is likewise produced by refraction. When sulphurous and other vapours take fire, in the higher atmosphere,

we often observe streaks of light dart swiftly like rockets: when these vapours collect in a heap, take fire, and fall down, we think we see little balls of fire fall from the sky; and as at that distance they appear as large as a star, they are for this reason called falling stars; and the common people imagine that they really are stars changing place, or falling from heaven. Sometimes these imaginary stars are seen very brilliant, and beautifully coloured, descending slowly, and still acquiring new lustre, till at last they are extinguished among the vapours of the lower atmosphere, and fall on the ground, where it is said, they leave a slimy gluey matter behind them. Great globes of fire have sometimes been seen more luminous than the full moon, with long tails: probably they are sulphurous and nitrous vapours, which accumulate and take fire, for they traverse the atmosphere with great velocity, and afterwards burst with a loud noise: sometimes when the inflammable particles are of a very different nature, they disperse without noise in the upper regions of the air.

The little flashes seen in the summer evening, after the intense heat, are produced by vapours in the atmosphere, which are less visible, because they are higher up. This meteor is different from real lightning, as it never is accompanied by thunder. Properly speaking these flashes are the reflection of lightning, which is at too great a distance for us to hear the noise with which it is accompanied. For a flash at the height of a mile may be seen at the distance of a hundred miles, whereas we can scarce hear the thunder at ten or twelve miles distance.

The Flcing Dragon, the Dancing Goat, the Burning Beam, and various other meteors, owe their odd names to their singular appearance. They are nothing but gross and slimy vapours which ferment in the wet regions of the lower atmosphere, and which being pressed in different directions by the agitated air, take those various forms to which people give extraordinary names. Several naturalists have produced some of these phænomena in miniature, by mixing certain substances together.

None of the nocturnal appearances are more remarkable and splendid than the Aurora Borealis: it is generally observed from the beginning of autumn till spring, when the weather is calm and serene, and when the moon gives but little light. They are not always the same. It is generally towards midnight that a light like the dawn of day appears. Sometimes we observe streaks of light, white and luminous clouds in constant agitation. But when the Aurora Borealis rises in all its perfection, we generally see in calm and clear weather towards the north, a dark space, a black and thick cloud, the upper part of which is edged with a white and luminous border, whence rays, brilliant sparks, and resplendent pillars dart continually, and grow yellow and red as they rise; afterwards meet, unite, and form thick and luminous clouds; finally terminate in pillars of all colours, from whence rays of light dart out; and then this object is in its full splendour and beauty.

O God! how magnificent art thou! even the night proclaims thy majesty. When I behold these magnificent scenes, may I silently adore thee! The

night declares thy majesty, and all nature proclaims thy greatness.

Sept. 26.

Reflections on the first Creation.

Stop, my soul, and consider this wonderful work of God! Behold how his eternal power and Godhead shine forth, in forming so many millions of worlds, in forming this which I am destined to inhabit, and in furnishing it so well with such an infinity of creatures, rational and irrational, animate and inanimate! What infinite wisdom is displayed in the vast variety, the comely order, and the mutual subserviency of all things to the good of each other, and glory of God! What goodness in forming such a multitude of beings to partake of his bounty as their all in all! What goodness towards man in forming him after his own image, and in preparing this world as a commodious lodgment for him in his way to the mansions of bliss. Let me then, in all things, in heaven, in earth, in air, in sea, and in land; in grass, in herbs, in trees, in sun, moon, and stars; in fishes, in fowls, in cattle, and in creeping things; in angels, and in men behold the excellencies of my God! Let me enjoy God in all things, and all things in God! and may I be fashioned, notwithstanding my guilt and unworthiness, into an abridged world, into a monument of redeeming mercy, to the praise of the glory of his grace

Am I a Christian philosopher? Let me contemplate the creatures of God in their almost in

finitely diversified natures, qualities, and uses. Let me contemplate light and the heavenly luminaries in their mysterious nature, extensive range, prodigious, but daily proportioned distance, rapid motions, and powerful influences. Air, fixed and unfixed, inflammable and uninflammable, in its fluidity, weight, elasticity, and usefulness, for forming winds, promoting animal life, and transmission of light. Water, in its fluidity, dispersion, saltness, or freshness, penetration, and fitness for forming rains and dew, and promoting the growth of vegetables, &c. Stones, metals, and moulds, in their adhesion, ductility, forms, colours, and uses. Vegetables, in their structure, curious parts, growth, and almost infinitely diversified forms, colours, and uses. Animals, in their curious parts, connected structure, and mysterious life; their dependence on food their beautiful forms, melodious, awful, or plaintive notes, &c. And with these the infinite divisibility of matter, the laws of air, attraction, gravity, electricity, and magnetism. Let me consider rational spirits; let me consider myself, in my powers of thinking, willing, recollection, sociability, and union with a body, as proofs of the existence and displays of the perfections of God, my God in Christ: of whom, through whom, and to whom are all things. Let me always consider his creatures as memorials of his creating, preserving, and governing power, and as a means of impressing my heart with his presence, observation, and influence. Let me rejoice to view all creatures, as formed and fitted for subserving and promoting God's great and principal work, viz. our redemp-

tion by the blood of his Son. May all creatures excite and lead me constantly to think on, admire, adore, and live to the glory of God, while I remain here in this lower sanctuary on earth; and to be always mild and humble, as brother to, and dependent on the meanest animals, insects, or atom in it. Yet I would look higher than this perishing world, even to that glorious state where there shall be no more distresses, sorrow, nor death; but God shall be my everlasting light, and my God my glory.

SEPT 27.

On Amphibious Animals.

THERE are several species of animals that can live either on the land or in the water, and on that account are termed amphibious. They are all cold-blooded, and have something gloomy and disgusting in every part of their form: they are dull and ugly in colour, of a nasty smell, and a hoarse voice, and many of them are very venomous. They have only gristles instead of bones; their skin is sometimes smooth, and sometimes scaly; most of them choose dirty infected places to hide and live in. Some are oviparous, and others viviparous. The former do not hatch their eggs themselves, but leave them to the heat of the air or water, or deposit them in dung. Most of them live on prey, which they obtain by strength or cunning: in general they can support hunger a long time, and appear to live a hard life. They are formed into two classes: the first class walks, and have feet. The tortoises,

which are of that class, are covered with a strong shell, like a shield. The land-tortoise is the smallest.

There are different kinds of lizards: some have a smooth skin, and others are covered with scales; some of them also have wings, which are then called dragons. Among those that have no wings we reckon the crocodile, the cameleon, which can subsist six months without food, the salamander, which some say can live in the fire without being consumed, because the cold slimy fluid which it emits puts out the coals.

The second class of amphibious animals are serpents: they have no feet, but crawl upon their bellies, by means of the rings and scales with which their bodies are covered: their back-bones are constructed in a particular manner favourable to this motion. Many of them have the property of attracting birds or small animals to prey upon: seized with terror at the sight of the serpent, and perhaps stunned with its venomous exhalations and stench, they have no power to fly, and consequently fall into the extended jaws of their enemy. Serpents have the power of stretching their jaws to that degree, as to enable them to swallow animals thicker than their own head.

Probably some may say, why has God created such animals which seem only to exist for the torment and destruction of mankind? Such questions as these shew that we only think of ourselves, that we form rash judgments, and are prone to find fault with the works of God. These questions are highly unbecoming and culpable. It is rash to sup-

pose that lizards and serpents were not created for the general good; for if among amphibious animals some are found which do much mischief, it is certain that most of them are quite harmless. Not more than a tenth part of the serpents are venomous, which is certainly a proof of the divine goodness: besides, even those that are mischievous, are so formed in general, that it is easy to escape them. But many amphibious animals are really useful; some for food, and some for medicine. In short, the divine wisdom is as conspicuous here as in all other things; and if we were not stupid and blind we should see it. May divine grace then open the eyes of our understanding, that we may see the glory of God displayed in his works, and in his word!

SEPT 28.

The works of God are perfect.

WHAT can equal the perfections of God's works, or who can describe that power that is visible throughout the whole? It is not only the greatness, multitude, and variety of them that we admire, but that each particular work is done with such infinite art, each so perfect in their kind, and the most minute productions so exact and regular, as to proclaim, as with millions of tongues, the greatness and unlimited knowledge of their Author. We are astonished at the different arts lately invented, by means of which things are done that would have appeared supernatural to our ancestors. We ascertain the height, the depth, and the breadth,

of bodies; we know the course of the stars; we can build habitations to float upon the seas; and we accomplish many other works which do credit to the human understanding. But what are all the inventions of men in comparison of the least of God's works? At best the imitation is faint and imperfect: the copy is very far beneath the original. When we examine the Almighty's works with the naked eye, or with a microscope, we find them equally wonderful and beautiful. The wisdom of God has composed and regulated all the parts of each body with infinite art, by number, weight, and measure. Such is the prerogative of unlimited power, that all his works are regular, and in perfect proportion: from the greatest to the lowest of his works there is a wonderful regularity throughout: there is no void: in this immense chain of created beings no link is wanting, nothing is useless; all is necessary to the perfection of the whole. Who can describe the innumerable beauties, the various charms, the pleasing mixture of colours, the different hues, and all the ornaments of the fields, the valleys, and the mountains?

Have not all the works of God a particular and distinct beauty? How wonderful must the power of that Being be, who by a single act of his will has given existence to all these creatures! But to admire the Almighty's power, it is not necessary to revert back to that time, when at his word all things were drawn from the depths of nothing and though instantaneously created, yet in a state of perfection. Does not each spring present to our view a new creation? Can any thing be more wonderful than

the resolutions of the seasons? The valleys, the fields, the forests, all die, in some degree, towards autumn; and in winter nature is stripped of its ornaments; all animals languish, every place becomes a desert, and nature appears insensible and dead. But even this divine power is secretly working and labouring for the renewal of nature: animation is restored, and all things are preparing for a sort of resurrection. Can we behold all these things without admiring the power and wisdom of God? Can we breathe the cool air without having our minds seriously impressed? Must I not exclaim with the Psalmist, "O Lord, how manifold are thy works! in wisdom hast thou made them all! the earth is full of thy riches!" "Thou art a rock and thy works are all perfect!"

SEPT. 29.

Fruit.

THIS is the happy season in which the divine goodness pours out upon us fruits of all sorts. The charms of summer now give place to more solid enjoyments. See how the boughs of the apple-tree bend under the weight of that golden fruit, the beauty of which is still enhanced by its purple streaks. The melting pear, the delicious plum, display their charms, and seem to invite the hand of the master. We should be inexcusable, if at the sight of all these blessings, so bountifully bestowed upon us, we did not endeavour to sanctify the pleasures of autumn, by reflecting on the kindness of our Creator. With

what wisdom has God distributed fruit through the different seasons of the year. It is principally in summer and autumn that nature has made us those rich presents; but by the assistance of art we are also favoured with them both in winter and spring; and our tables may be furnished with certain kinds through the whole course of the year. From the month of June, nature herself presents us with rasberries, gooseberries, and common cherries. The month of July furnishes us with cherries, peaches, apricots, and some sorts of pears. The month of August seems rather too lavish than merely to give us fruits. In the present month we are provided with some grapes, winter-pears, and apples. October is not wanting, but presents us with apples pears, and the delicious fruit of the vine.

It is with this wise economy that nature measures out and distributes her gifts, on the one hand that we may not be overloaded with too great an abundance, and on the other that we may still have a successive variety of enjoyments. It is certain, that in proportion as we advance in winter the number of good fruits considerably diminish, but by art we can preserve some for that season also.

How abundantly has God bestowed fruit upon us! Notwithstanding the continual ravages of birds and insects, there still remains a sufficient quantity to make up this loss. Calculate, if possible, the fruit which only one hundred trees bear in a good year, and you will be astonished at the amazing increase. What is the design of this abundance? It cannot be merely the preservation and propagation of trees; much less would certainly answer that end

It is evident, therefore, that God designed to provide food for man, and in particular for the poor. In bestowing so much fruit, he has furnished them with every means of subsistence, which is, at the same time, nourishing, salubrious, and so pleasing, that they have no reason to envy the rich their far-fetched dainties, so often injurious to health. Hardly any food is so wholesome as fruits, nor can any thing be more delicious. Each sort has a flavour peculiar to itself; and this variety renders them doubly pleasing. Thus God, like a kind parent, provides not only for the support of his creatures, but also for their pleasure. May we be as trees of righteousness planted by his hand, and bring forth fruit to his glory. Amen.

Sept. 30.

The 147 *Psalm imitated, and the Universe invited to praise God.*

Praise ye the Lord, for he is almighty! he telleth the number of the stars, and calleth them all by their names. Earth and heaven celebrate him; great is his name, and glorious is his power; he governs with majesty; celebrate the Almighty!

Join all your voices to bless the God of love! come to him ye distressed; come to your Father; he is gentle, merciful, and gracious! all nature demonstrates his wisdom and beneficence.

The heavens blacken, but it is to wate the earth with fruitful rains; the fields are covered with ver

dure, the grass grows, and fruits ripen ; for the Lord pours down his bounty. God is love.

Let every thing that hath breath glorify his name. Birds, beasts, fishes, insects, nothing is forgotten, all are objects of his care, all are nourished by his bounty ! Let us praise him for ever and ever !

O how does he comfort and support those who trust in his mercy ! Frequently one friend cannot aid another ; and the greatest strength of man cannot save him from danger. Trust not in an arm of flesh ! Rest on the rock of ages ! He is the only Saviour ! Give him thanks, because he has revealed his will unto you, and gives you his laws, his gospel, and his promises. His word is is a source of life and salvation. O ye people of his covenant, how great is your happiness ! Praise, celebrate, and exalt the Most high ! Let the whole universe praise God. Great is the Lord ! Innumerable heavens are his pavillion, the thunder-cloud is his chariot, and the lightning walketh by his side !

The lustre of the morning is but the reflection of the hem of his garment : when his splendour goeth forth, the light of the sun is eclipsed ! Ye luminaries of his palace praise the God of love ! extol the Eternal ! Ye solar rays flame to his glory ; Earth praise thou the Lord !

Celebrate him thou sea ; foam ye billows to the honour of his name ; and ye rivers praise him in your course ! Ye lions of the forest roar to his glory ! Ye songsters of the grove sing, sing to your Maker !

Ye echoes reiterate his praises ! Let all nature

in joyous concert, sing to his honour! And thou, O man, lord of this lower world, join thy thanksgiving with the universal harmony!

God has done more for thy happiness than for all the rest; he has given thee an immortal soul, so that thou canst contemplate the structure of the universe, and become acquainted with the wheels of nature.

Exalt him high for thy own salvation: he has set his love upon thee, and sent his Son to redeem thee from all iniquity! Receive him as thy Saviour: rest on his righteousness, and in the efficacy of his atoning blood. He is the way to the Father; "the "way, the truth, and the life!"

Praise him in the morning, in the evening, and at noon-day! Unite thy voice with the voice of universal nature, and sing aloud to his honour! With all the powers of thy soul praise the triune Jehovah. Praise the Lord in all places of his dominions! Praise him, O my soul; and all that is wtihin me bless his holy name

Oct. 1.

An Hymn to the praise of God.

The heavens declare the glory of God, and all the globes of light which roll in the immense expanse celebrate the wisdom of his works! The sea, the mountains, the forests, and the deeps, which a single act of his will created, are the harbingers of his love, the heralds of his power.

Shall I alone be silent, and chant no hymn to his

praise? My soul longs to mount up to his throne: and if my language be imperfect, let my tears express the love I feel for my heavenly Father and my gracious Friend. True my tongue is that of a stammerer, but let the Most High see the holy flame, which his grace has kindled, burn on the altar of my heart. But, Lord, how shall I praise thee? Could I take the beams of the sun for my pencil, I could not sketch a single ray of thy essence; the praise which the wisest spirits offer thee is imperfect.

By what power is it that so many millions of suns shine with so much splendour? Who traced out the wonderful cause of these rolling worlds? O Jehovah! it is by thy breath: it is by thy Almighty word. Thou didst speak, and worlds ran into existence: then was this world produced. The birds, the fish, the cattle, and the wild beasts that sport in the forests, and, finally, man himself was created to inhabit it, and to rejoice in thy works. Our sight thou cheerest with delightful prospects; our eyes wander over the green fields, they view the sparkling drops of dew with which thou waterest the flowers, or they follow the windings of the limped stream, in which the trees are reflected.

In order to break the force of the winds, and at the same time to afford us the most enchanting prospects the mountains arise, and from them the wholesome springs proceed. The dry forests thou waterest with rain and dew, and thou coolest the air with the gentle breeze. Through thee it is that the hand of spring spreads the green lawn under our feet: thou gildest the corn, and givest colour

to the grape ; thou enablest man's mind to penetrate even to the starry heavens, to distinguish falsehood from error, and appearance from reality. It is through thee that he judges, desires, or fears : by thee he conquers death, and escapes from the tomb. I would ever acknowledge thy goodness, thy greatness and thy love ! Eternity will not be too long to speak thy praise, and proclaim thy glory.

Oct. 2.

On the Effects of Fire.

Perhaps nothing in nature can exceed the violence of fire, nor can we without the greatest astonishment reflect on the effects it produces, and the extreme swiftness of its operations ; yet these effects are overlooked. But we should endeavour to appreciate the value of this blessing. Every body knows that fire has the property of dilating the bodies which it penetrates : irons put into a metal plate when they are new, swell so much in the fire, that they go in with difficulty, but when once they are cold they come out with ease But this dilation is still more visible in fluid bodies, such as wine, beer, &c. Were it not for this property, the thermometer, by which the different degrees of heat are calculated, would be quite useless.

Observe the effects of fire on compact inanimate bodies ; how quickly do they melt. Fire communicates fluidity to water, to oil, and to all fat substances, and to metals in general : the reason is, the combination of these bodies is more simple, and the

particles of which they are composed are more homogenial than those of other bodies. Some solid bodies undergo other kind of changes. Sand, flint, and salt vitrify in the fire, while clay turns into stone. Marble and chalk turn into lime. These various effects do not proceed from fire, but from the different properties of the matter on which the fire acts. The fire of itself produces nothing new; it only discovers parts which were concealed in the bodies it acts upon.

Fire produces two different effects on fluids: it causes them to boil, and reduces them to vapour. These vapours are formed of the most subtile parts of the fluids joined with particles of fire; being lighter than the air, they ascend.

In regard to animals, fire produces through all parts of their bodies a sensation of warmth. The life of man could not be preserved without this element, for a portion of fire is requisite in the blood to keep it in motion. In order to preserve this motion and warmth, we imbibe a portion of fresh air, to which fire is ever united, while on the other hand we expel the air, which having remained some time in our lungs had lost its elasticity, and was loaded with superfluous humours.

These reflections should confirm us in this important truth, that God does all things with a view to his people's happiness. How many are the advantages that we derive from fire? By the union of fire and air, the seasons are renewed, and the moisture of the soil, and the health of man, are preserved. By means of fire water is put in motion without which it would become ice. It preserves

the branch in the bud. the plant in the seed, and the embryo in the egg. By it our food is prepared : it contributes to the formation of metals, and renders them fit for use. In short, when we collect together the various properties of fire, we may see that through it the Creator has spread a multitude of blessings over our globe. A truth which ought to impress our hearts with gratitude, teach us to love the Author of our being, and inspire us with true contentment. A perfect harmony runs through all the works of God ; and all his perfections harmonize in the plan of human redemption.

Oct. 3.

On the industry and instinct of Birds.

Birds have already afforded us many innocent pleasures. Now that the greatest part of these sprightly inhabitants of the air are about to leave us, and will return no more for a considerable time, let us renew our reflections upon them. The different instincts which God has given to birds, may add to the pleasures of our reflections upon them ; these instincts are all useful, each is necessary to the preservation and well-being of the animal ; and the little we know of this subject is sufficient to give us the most exalted idea of the divine wisdom and goodness.

When we reflect, in the first place, on the instinct which leads birds to move, we find in that alone a just cause for admiration. We know by experience that bodily motions require something more

than strength and well-formed limbs : we are not able to balance ourselves till we have made many trials, and had many falls, so as to walk with ease, to run, jump, &c. ; and yet these motions seem easier to bodies constructed as ours are than to the birds. Their bodies do not rest perpendicularly upon their feet, and yet a chicken can stand upright, and begin to run as soon as it is out of the egg. Young ducks, just hatched by a hen, know their own element, and swim in the water without example or instruction. Other birds, by a particular instinct, can rise at once from their nests in the air ; can balance themselves in that element with ease, and take their course beating their wings in equal measure ; can stretch out their feet, spread their tail, and make use of it as an oar, and frequently take long journeys into countries very remote from the place of their birth.

They likewise provide their food with admirable art : some birds, which are not, properly speaking, aquatic, yet feed on fish. In this case it is God that teaches them to catch their prey. They place themselves on the brink of the strange element, and when a shoal of fish comes (which they can see at a distance,) they pursue them, skim along the surface, and suddenly dive into the water and carry off a fish. How incredible is the strength of the condor, if it can, as some report, carry off deer and oxen. The wild quail is said to take small birds of all sorts under its protection, on which it lavishes its tenderest care. One might spend many years in pursuing observations of this sort, without being able to explain the principal mysteries contained in the

instinct of birds. Such reflections as these should be, as it were, a first step to more sublime meditations : to this point I wish to conduct the reader. Nature separated from its Author is an unmeaning word. Let us glorify the Creator, and acknowledge that it is he alone who gives wisdom even to the fowls of the air.

Oct. 4.

On Animal Reproduction.

Here a new scene of wonders presents itself, which appears totally to contradict the principles formerly adopted in regard to the formation of organized bodies. It was supposed for a long time that animals could only multiply by eggs, or by producing young alive ; but it has since been found, that this principle is liable to exceptions, as certain animals bodies have been discovered which can be divided into as many complete bodies as we please ; because what is wanted to each piece, when separated is soon repaired. There now remains no doubt but the polypes belongs to this class of animals, though it resembles plants in its form, and in its mode of propagation. The bodies of these zoophites may be cut either across or lengthways, and these bits will become so many complete polypes. Even from the skin, or smallest bit of the body, there will grow one or more of these animals ; and if several bits cut off be put together by the ends, they will unite and become one and the same body. This discovery gave rise to other experiments, and it

has been found that the polypes are not the only animals which can live and grow after being cut in pieces.

The common earth-worm has the property of multiplying after being cut in two. To the tail part there grows a new head, and thus the two parts become two complete animals. After having cut the worm in two, it would be to no purpose to put them together again in order to unite them: they remain some time in the same state, except that they grow more or less thin, then there appears at the end of one of these pieces a small whitish pimple, which gradually enlarges and lengthens; soon after the rings are seen, at first very close together, but extend insensibly on all sides: new lungs, new heart, new stomach, &c. form with the rest.

You may make the following experiment every day with snails: cut off their heads close to their horns, and in a certain space this head will be reproduced.

A change somewhat similar takes place in crabs. Break off one of their claws, and put the animal again into its element, and the claw will be reproduced. These are convincing proofs that some animals are perpetuated by being cut and divided, and that certain insects are produced in the same way as a branch shoots out of a tree; that they may be cut in pieces, and may be turned inside out like a glove, and still continue to live, eat, grow, and increase their kind.

Here a question arises, which perhaps none can resolve in a satisfactory manner. How does it happen that the parts cut off as above grow again? It

may perhaps appear that all the parts essential to life are dispersed over the whole body ; but the infinite wisdom of the Creator surpasses all weak conceptions. With God nothing is impossible. The hand which formed the polype and the earth-worm has proved to us, that, when necessary, it can make the animal form and constitutions like plants or simples. In other cases it has done it still more ; and descending gradually, has arrived at the remotest limits of animal nature. But these limits we are ignorant of ; let us therefore learn to be humble, and let us admire and adore the supreme wisdom ; it is never more sublime than when we can no longer trace it. Animal re-productions may put us in mind of the resurrection of the body : what is now seen only in miniature will then appear in the great ; what we only observe in other bodies we shall experience in our own : that which is sown in dishonour shall be raised in glory, and the righteous shall possess a spiritual body, destined to enjoy eternal happiness.

Oct. 5.

On the Organs of Taste.

Our happiness would be diminished, if we had not the faculty of distinguishing different kinds of meat and drink by tasting them. The various kinds of fruit afforded by the season, naturally leads to this reflection. We should lose much pleasure, if the apple, the pear, the plum, &c. tasted all alike.

Therefore the sense of taste is a gift on which we

ought to reflect with the warmest sentiments of gratitude. But how is it that we distinguish and taste our food? It is by means of the tongue. For this purpose its surface is covered with small papillæ, which enable us to distinguish the flavour of the salts, as they dissolve upon the tongue. Tasting, therefore, depends on the nerves, as is clearly seen in dissecting the tongue; for after the membrane which covers it is taken off, a multitude of small roots, where the nerves terminate, appear; and these are the nervous papillæ that give us the sensation of taste; and where these are not the sensation is wanting.

When highly flavoured things are put under the tongue, we are scarcely sensible of it till they are attenuated, and till we bring them upon the surface, then we distinguish their flavour; consequently the sensation of taste is not in full force but where the papillary nerves are in greater number, which is nearest the throat.

With what astonishing art must this organ of taste be formed, all the parts of which no anatomist has yet been able to find out! It must be the effect of the greatest wisdom that the tongue should have more sinews and members than any other member, and that it should be full of little pores to let the salt and other savoury particles penetrate deeper, and in greater quantity, into the papillæ. Another thing worthy of admiration is the duration of the organs of taste. Notwithstanding their very delicate structure, they are more durable than instruments of steel or stone. Our clothes tear, our flesh wi thers, our bones dry up, but the sense of taste

survives them all, if we do not wantonly destroy it. What admirable designs may we not discover, even in the preparation of those organs. O man! thou art the only creature who knows himself endowed with senses, and the only one capable of praising God for them. Endeavour, through divine grace, to employ these faculties in a proper manner. Consider thy obligations to pay homage to thy Creator. No creature enjoys what thou dost, even in regard to the sense of taste. The food of other animals is contained within narrow limits; whereas man is supplied with food from all quarters. The heavens and the earth, the air, and the ocean, offer him their tribute. The tops of the mountains, the bottom of the valleys, the sea and the lakes, furnish us with food and pleasure. What reason have we highly to value this gift of the Creator! Yet let us take care not to value it beyond the purpose for which it was given. It should be viewed as a mean of leading us to noble designs. It would therefore be the highest degree of madness to place our happiness in the pleasure of which this sense is the organ. We in that case, should sink on a level with the brutes, whose chief happiness consists in eating and drinking. Do not let us forget our immortal souls, which none but God can satiate.

Oct. 6

On the Divine government with respect to Natural Events.

Whatever happens in the sky, earth, sea, or air, is according to the law prescribed by God. He has

a particular influence over all events, and orders all things after the counsel of his own will: he often makes use of natural causes to chastise or reward mankind: he prevents or he assists the designs of man—sometimes, by winds and storms, and sometimes by the flux and reflux of the sea. True it is that God does not in general interrupt the course of nature, but it is no less certain that nature cannot act forcibly without his assistance and concurrence. God can and does influence his creatures without interrupting the course of nature. Fire, water, wind, and rain, have their natural causes, and particular virtues; but God uses them in a manner adapted to their nature, in order to accomplish his wise ends. The sun he makes use of to warm the earth, and render it fruitful: he employs the rain and wind to purify and cool the air, but it is in the manner and degree that best suit his designs. Many of the blessings and evils of this life proceed from surrounding objects, but those objects are under the direction and influence of the All-wise. On this is founded the doctrine of rewards and punishments, of virtue and vice. He gives peace and prosperity to crown the one, and, when he pleases, sends plague and famine to punish the other. In a word, all natural causes are in the hands of God, and are immediately under the guidance of his providence. God has in some measure subjected natural causes to human industry, and has certainly a just right to reserve to himself the government and direction of them. Hence it may be concluded, how necessary it is that a particular providence should watch over the guidance of the world.

Doubtless natural causes are excellent instruments, but in order that they be useful they must be put into the hands of a skilful workman. The laws of nature once established, it is unreasonable to wish that God should change them every moment: that, for instance, if we should fall into the fire, it should not burn us; or into the water, it should not drown us. God is not obliged to work miracles to save men from misfortunes, drawn on themselves by their own irregularities. He that admires providence in all things, shall never want a providence to admire. Let us rejoice that the Lord reigneth: and while he takes care of sparrows, no doubt he will feed and support his own children.

Oct. 7.

On the inexhaustible riches of Nature.

Nature is so bountiful to us, so abundant in means to supply the wants of every creature, so rich in gifts, that they can no more be numbered than the drops of water in the ocean.

How many things does one single man stand in need of, during a life of sixty or seventy years, for eating, drinking, and clothing, for the sweets and conveniences of life, for pleasure and amusements, without mentioning extraordinary cases and unforeseen accidents! In all situations, conditions, and ages of man, from the king to the beggar, from the infant to the old man, in all conditions, in all countries, and according to the different manners of the people, each man has his particular wants;

what suits one will not in all respects suit another; and they all require different means of subsistence; yet nature can answer all these demands, and each individual is supplied with all the necessaries of life. Since the foundation of the world the earth has not failed to open her bosom; the mines are not exhausted; the sea always furnishes subsistence for an infinity of creatures; and plants and trees are as fruitful as ever. Beneficent nature varies her riches, that no one place may be too much exhausted; and when some sorts of plants or fruit begin to diminish, others are produced: and it is so ordered, that the instinct and taste of mankind should constantly lead them to the most abundant productions. How wise an economist is nature! she takes care that nothing is lost. Insects serve as food for animals that are larger, which, in their turn, are useful to man: if they do not afford food for men, they furnish them with clothes, with arms, and the means of defence, or they are useful in medicine. All things in nature, even the most corrupted substances, have their use. How bountiful is nature! her most beautiful attire requires only light and colours; with these she is richly provided, and the appearance which she presents us is varied continually, according to the different points of view in which they are seen. Here the eye is struck with most beauteous forms; there the ear is charmed with melodious sounds, and the smell is indulged with the most agreeable perfumes. Nature combines and mixes her blessings as the physician does the ingredients of his prescriptions.

And what are we that we should constantly enjoy

these blessings? Yet this is not all; how many blessings infinitely more precious are bestowed upon the most rebellious sons of men. Nature, indeed, is rich, but grace is infinitely more so. Salvation, through Jesus Christ, is full, free, and everlasting. Let those that enjoy this salvation, which flows from an inexhaustible fountain, take care not to turn the grace of God into licentiousness but live according to the precepts of the gospel.

Oct. 8.

On Petrifactions.

The transmutation of several substances from the animal and vegetable kingdom into the mineral, is a circumstance well worthy our consideration. Petrifactions may be considered as a kind of medals, the explication of which casts a great deal of light on the natural history of the earth.

The first thing to be remarked in petrifications is, their exterior form, which shews that these fossils have undoubtedly belonged either to the animal or vegetable kingdom. Petrifactions of any part of the human body are seldom found. The most extraordinary skeletons met with in the earth, are those of elephants, which have been found in many parts of Germany. Petrifactions of aquatic animals have been frequently met with: there are sometimes fish entirely whole and perfect, even to the smallest scales; but this is little in comparison of the number of shell-fish and small worms found changed into stone in the bowels of the earth. Their number is

prodigious, and there are more different species of them than are to be found alive. Sea petrifactions are found in great abundance all the world over: they are met with on the tops of mountains, many thousand feet above the surface of the sea; and quantities are found in the earth, at different depths. Petrified plants, of all sorts, are met with in several beds of the earth; but sometimes the beds are destroyed, and nothing remains but the impression. Whole trees are found in many places, buried more or less deep in the earth, and turned into stone; but these petrifactions do not appear to be of an ancient date. But how have all these petrified substances got into the earth? especially, how could marine substances get to the tops of such high mountains? How could animals, who are destined to inhabit the sea, and which belong to no other element, be transported so far from their natural abode?

Different causes may be assigned for this phænomenon. Perhaps these petrifactions prove that the greatest part of the earth was formerly covered with water: indeed it is impossible to account for these appearances on any other principle.

The great quantity of petrified shell-fish found in mountains, and which form regular beds, seem to indicate that these heights formerly made part of the bottom of the sea; and this opinion is strengthened be the consideration that the present bottom of the sea exactly resembles the surface of the earth. We have but a very imperfect knowledge at present of the manner in which nature forms these petrifactions. It is certain, however, that no body can undergo this change in the open air, for in that ele-

ment animal and vegetable bodies rot and corrupt; therefore, where petrifactions are found, there can be no free action of the air: neither has a barren dry earth any petrifying quality. Running water may form a crust on particular bodies, but cannot turn them into stone; the course of the water alone prevents it. It is, therefore, very probable that petrifactions require moist soft earth, mixed with dissolved stony particles: the stony juices penetrate into the cavities of the animal bodies, impregnate and unite with it in proportion as the body itself evaporates, or as they are absorbed by alkaline substances.

If petrifactions were of no other use than merely to throw light on the natural history of the world, they would even then be worthy of consideration; but they must also be considered as proofs of the operations and changes which nature works in secret: and in this also the wonderful power and wisdom of God are manifested. Blessed be his glorious name for ever! Amen.

Oct. 9.

All the operations of Nature are gradual.

An admirable gradation, or insensible progress, from a simple to a more compound perfection, may be observed in nature. There is no middle species which has not something of the nature of that which precedes, or that which follows it. In a word, there is no leap or void in nature. Earth and dust form

the principle, and the component of all solid bodies; accordingly it is found in all which human art has analized. From the mixture of salts, oils, sulphur, &c. with earth, different kinds of soil result, more or less compound, light, or compact. This naturally leads us to minerals. The variety of stones is very great; and their form, colour, and size, are very different: they contain all sorts of metallic and saline particles; and from hence proceed mineral and precious stones. In the last class of stones there are some with fibres and a sort of leaves, such as slate, lithophites, the stony flower of the mine, which lead from the minerals to the vegetables. The truffle appears to be the lowest among the vegetables. Next come the numerous species of mosses and mushrooms. These plants are all imperfect, and properly speaking only form the limits of the vegetable world. The more perfect plants divide in three sorts, which are distributed all over the earth: they include grass, shrubs, and trees. The vegetable and the animal kingdoms seem to be united by the polypus. From the first view, this singular production would be viewed only as a plant; but it appears from a closer inspection, to perform animal functions. Reptiles appear to be linked to fish, by the water-snake. The flying-fish leads us to the bird species. The ostrich, which has legs something like goat's, and which rather runs than flies, seems to unite the birds with the quadrupeds. The ape joins hand with man and beast. In human nature also there are gradations, as well as in all things else. Between the ape and the most perfect state of man there are a grea-

many links, and many more still between men and angels; but there is no comparison between the highest archangel and the Creator of all things. But the gradations, plans, and perfections of the world to come, are concealed from us by an impenetrable veil.

These remarks may be sufficient to shew that every thing in the universe is closely united together. There is nothing without design: all things are the immediate effects of something that precedes them, or they determine the existence of something that is to follow. Nature does not go suddenly, but by degrees from the component to the compound; from the less to the more perfect; from the nearest to the most remote; from the inanimate to the animate; from bodily to spiritual perfection. But still our knowledge of this immense chain of beings is very imperfect. We know but a small number of ill-connected broken links; and yet defective as our knowledge is in this respect, it is sufficient to give us the most sublime idea of the wonderful chain and infinite variety of beings of which the universe is composed. May the whole lead us to thee, thou Supreme Being, although there is an inconceiveable distance between thee and mortals, which no understanding can measure! Thou art the only Being beyond the chain of nature, and whatever exists, owes its perfection to thee.

Oct. 10.

On the Fall of the Leaf.

The effects of approaching winter are already visible in the woods and gardens. The plants are most or them loosing their leaves, which is their chief ornament: it is the cold that causes the leaves to fall, for they are no sooner covered with frost than they begin to fall in abundance, and all the vegetables are stripped of their clothing; nor can it be otherwise as the cold causes the sap to stagnate in the plants. It must not be supposed, however, that these fallen leaves are entirely lost, and of no use: the contrary is evident, both from reason and experience. The rain and snow wash the salts out of them, and convey them to the roots of the trees; and when they are heaped together upon the young plants, they preserve their roots; they likewise cover the seeds, and keep them warm and moist. This observation particularly applies to the oak-leaves: they serve to manure both the tree itself and its shoots, and are also very useful for forest pasture; and they promote the growth of the grass on which they fall and rot. So important is this advantage, that the fallen leaves are never taken up for the purposes of making dung, unless they be so abundant as to choke rather than to nourish the grass.

It may possibly be said, that the fall of leaves is destructive to a multitude of insects that live on trees and plants. It must be acknowledged that autumn sweeps away whole shoals of insects, with their nests; but it does not follow from hence that

they all perish: some of them may even live on the ground under the leaves, which they cover and guard them from the cold.

The fall of the leaf is a suitable emblem of the frailty of human life, and all earthly things. "I am a fading falling leaf; death walks by my side; I may wither even to-day, and to morrow return to the dust."

I am suspended by a slender thread, and may be deprived of all my beauty and vigour in a moment. A few gales of cold air may put a period to my life; and "the place that now knows me may know me no more for ever." When I die, may I leave behind me the well-ripened fruit of righteousness, love, and holiness; then shall even death himself be a welcome messenger.

Oct. 11.

Different sorts of Earth.

We know not what is in the centre of the globe. Those who work in the mines have never been able to go lower than 900 feet: if they attempt to penetrate further, the too great pressure of the air would kill the men, even if they could protect themselves from the water which rises in proportion as they descend. But what is the depth that mines go in comparison of the semidiameter of the earth! Consequently the inside of the earth must be in a great measure unknown to us: miners themselves have scarcely penetrated through the first

crust. All that we know is, that when we dig some hundreds of feet this crust, or coat, is found to be composed of several different layers or beds, placed one above another: these strata or layers are very much mixed, and their substance, matter, thickness, and direction vary considerably at different places. In general, under the common earth in gardens, &c. we find clay and fat earth, and sometimes alternate layers of sand and marble: first, black earth, or the top soil, is composed of putrified vegetable and animal substances: it contains many salts, and much inflammable matter; properly speaking, this is dung. Second, clay is more compact than black earth and retains water longer on its surface. Third, sandy earth is hard, light, and dry; it does not retain water nor is it dissolved in it: it is the poorest of all earths, though some vegetables may grow upon it. Fourth, marl, is softer, more meally, and attracts moisture better. Fifth, marshy ground contains a vitriolic salt, which is often too sharp for plants. Sixth, chalk is dry, hard, and brittle; and seventh, stony earth; even this is often fruitful. The smoothest stones, though bare of earth entirely, are covered with moss, which is a vegetable: and birch is known to grow between stones, and in the clefts of rocks to a considerable height. These different kinds of earth are most wisely arranged: great are the advantages we derive from them. These different layers of sand, gravel, and light earth, give an easy passage to fresh water, which is filtered in passing through these different beds, becomes soft, and is afterwards distributed on all hands for the supply of

OCTOBER.

"Wine is a gift of divine Goodness." Oct.r 12.th

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men and animals. These strata are also the reservoirs and canals of springs and fountains; and it is remarkable, that such canals are found in every country on the face of the globe. This variety of soil is of great use in the vegetable kingdom: for it is owing to this that herbs, plants, and trees grow of themselves in most countries.

Some have asserted, that in the space of forty-eight hours, lettuce, cauliflower, and sallads, may be produced fit to eat, if the seed be first steeped in brandy, and the ground in which they are sowed mixed with pigeon's dung and powder of slaked lime. A proper preparation of the soil is indispensably necessary in order to vegetation.

These observations should lead us to acknowledge the wisdom with which God has prepared every soil for the production of plants, for the good of his creatures. It would, therefore, be unjust to complain of the sterility of such soils. The goodness of God has ordained that the countries allotted for man to live in should produce all that is necessary for his subsistence. If there are lands not so fertile as others, the Creator has made amends for this defect by greater advantages, or he inspires man with so much the more industry and ability for labour.

Oct. 12.

On Wine.

Wine, like all other mercies, is a gift of the divine goodness, and should excite our admiration

and gratitude. Wine is intended to add to the happiness of man, and to be of use to our health. Other drinks, whether natural to us or not, do not produce these effects to the same degree. It is a means of recruiting exhausted strength. Bread enables man to act, but wine causes him to act with spirit, when it is taken in moderation.

Let us here reflect on that goodness which gave to this salutary juice qualities so superior to the poorness of its origin, and the dryness of its native soil. God has produced these effects by the mixture of oily, saline, and volatile particles, of which all wines are composed.

How great is the divine goodness in the abundance, variety, and richness of wines. They are numerous, and vary in colour, taste, quality, and duration. Indeed there are almost as many sorts of wines as there are of soils; for the wise Creator has allotted to each country that wine which is best adapted to the climate, and to the constitutions and modes of life of the inhabitants of each. But what shameful abuse men frequently make in the use of wine! Some unwise and tyrannical legislatures have prohibited the use of it under severe penalties, not for fear of its injuring the health, but from mercenary or superstitious motives. Such, for instance, was the conduct of Mahomet in forbidding the use of it to his followers. But surely it would be quite as consistent and rational to prohibit the eating of grapes, whence that liquor is derived.

The adulteration of wine is a shameful and pernicious practice, and deserves the severest censure; for should a poor sick person, from the

scanty pittance of his labour, purchase a little wine to revive his drooping spirits, and recruit his exhausted strength, instead of experiencing the desired effect, he would find himself worse, and his disorder aggravated, because wine adulterated, perhaps with pernicious spirits, operates like poison, and, instead of promoting health, may ultimately terminate in death. Such is the scandalous consequence of adulterating wine; yet even worse is that deplorable abuse of it, by which men poison themselves by excess.

This liquor is a useful and salutary medicine, which supports animal life, and diffuses the vital spirits through the frame, it warms the blood, and conduces greatly to health; but the continual or excessive use of wine destroys these beneficial effects. Like dung to a tree, so is this liquor to the human body: it forwards the fruit, but injures the tree. As a wise gardener, therefore, only applies his manure at proper seasons, and in due proportions, as their nature and constitution require—thus also should we use wine. Let us always remember it is only given to recruit or refresh our spirits; and therefore never let us abuse a blessing given by that divine goodness, who is the Father of mercies, and the giver of every good and perfect gift.

Oct. 13.

On the Migration of Birds.

Numbers of birds which in summer had found a bounteous supply from our fields, woods, or gar-

dens, are now obliged to quit our climate to seek nourishment in other countries. Few pass the winter with us. The thrush, the partridge, the wren, the sparrow, the raven, the crow, and the woodpecker, stay here, but most others leave us during winter.

This migration is very astonishing; and if our attention has not been directed to these creatures while with us, let us at least bestow a reflection upon them now they are gone. Some birds, without flying very high, or separating from each other, draw gradually southward in search of that food proper for them; but they return very soon. Others, called birds of passage, after collecting together at certain seasons, go off in large bodies to distant countries: some go only from one country to another, where the air and food draw them; but others cross the ocean, and take voyages of surprising length. The best known birds of passage are quails, swallows, wild-ducks, plovers, woodcocks, and cranes, with some others that feed on worms.

Quails, in spring go from Africa to Europe, for the enjoyment of more moderate heat. In their flight they look like clouds; and often fall through fatigue on the decks and rigging of ships, when they are easily taken

Swallows are different; many of them stay in Europe, and hide themselves in holes under ground, in marshes, and in the bottoms of rivers; where they remain firmly attached to each other, out of the way of men and animals.

Wild-ducks and cranes also, every winter, seek milder climates. At a certain day they assemble,

and generally form themselves into two lines, which unite in a point like a V reversed (thus Λ): one bird cuts the air in front, then the rest always extend in that manner, each placing its bill on the tail of that before it. But as the efforts of the leading bird through the resisting air must be greatest, he is at certain intervals, like a sentinel, relieved by another which takes his place, while he returns into the line.

However, all birds of passage do not go in company; some go quite alone, others with their mates and families, and others in small parties. Their passage is very quick, for it is computed that flying only six hours a day will carry them 200 miles. They might therefore traverse to any country under the line in seven or eight days. This has been proved by swallows, which have been seen on the coast of Senegal from the 9th of October, which is within eight or nine days after their departure from Europe.

We cannot too much admire these migrations. The difference of heat and cold, and want of food, certainly warn them to change place; but when the air is so mild they could remain in it, and when no food is wanted, what is the reason they still go at the appointed time?

How do they know their wants shall be supplied, or that they shall find a warmer climate? How shall we account for their leaving our countries all at the same time, as if the day of their departure had been unanimously fixed? What guides them in dark nights and without knowing the countries, to pursue the direct course? These are interest-

ing, though embarrassing questions, because we know little of the instinct and nature of these animals. We may, however, see in these migrations the wise and beneficent direction of Providence How wonderful are the means used to preserve certain birds! With what tender care is their food pointed out when it fails in some regions! Hence learn, that throughout the vast empire of nature every thing is planned with infinite wisdom. Instinct to birds is what reason is to man; and does it not equally serve the wise designs of God? Let us reflect on the admirable guidance of providence, and blush at our doubts, our cares, and our incredulity. That merciful God who directs the course of the birds, will with equal goodness guide those on whom he has deigned to bestow reason: can man, the lord of the creation, be less the object of the Almighty's care? Let us trust to his merciful protection and walk in his way, and he will preserve us ere and afterwards receive us into glory.

Oct. 14.

The variety of Trees.

Great is the variety among the vegetable tribes, yet there is an equal diversity among trees; for some, like the oak, are remarkable for their strength and roughness, while others, as the elm and fir, form a striking contrast to it, by their smooth and slender appearance; and some, like the thorn and box, never grow to any considerable height. Some have hard and rugged outsides while the birch, the ma-

ple, and the poplar, are admired for their fine and delicate covering. Some are employed as decorations to the spacious apartments of the great, while others serve for the more plain, yet necessary purposes of life. Some are so weak and slender, that they are bent by every passing gale, while others resist unshaken the boisterous breath of Boreas. Some attain to a prodigious height and thickness; and after they have stood an hundred years they annually increase in circumference, while others arrive at their full growth in a very short time.

Pliny beheld with admiration these great trees, the shell and bark of which were sufficiently large to be formed into sloops, containing thirty persons. What then would he have said to those in Congo, the cavities of which make vessels to hold 200 men? or the trees, which if we may believe the account of travellers, are eleven feet in diameter and can bear the weight of 4 or 500 stone? There are some of this species at Malabar, which are computed to be fifty feet in circumference. The cocoa-tree, or a sort of palm-tree, is of this kind, and some of them bear leaves which will cover twenty people. The tulipot, which flourishes in the island of Ceylon, and for its gigantic height resembles the mast of a ship, is equally famous for its leaves; so immense is their size, that it is said one of them will securely shelter fifteen or twenty men from the rain; and when dried, they are so useful, that they may be folded up like fans, are extremely light, and appear no longer than a man's arm. On Mount Lebanus is still to be seen twenty-three old cedars, which are supposed to have escaped the deluge. A learned person who

saw them, assures us that ten men could not encompass any one of them; they must consequently be thirty or thirty-six feet in circumference, which does not appear incredible or disproportioned for trees of some thousand years standing. The gum-tree which grows in the islands of America, is mostly twenty-six feet round. It is not, therefore probable that the cedars are of so ancient a date as is reported, though it is certain that trees often live a great many years. There are some apple-trees which have stood a thousand years; and if we reckon the annual produce of such an one as I have formerly observed we must contemplate with amazement the prodigious fertility of a single pippin, which would be sufficient to furnish all Europe with trees. The great variety which we discover among trees leads me to observe the difference in mankind, with respect to their situations in life, their various opinions, their talents, and the improvement they make of them; as there is not a tree in the forest which may not be beneficial to its owner, so there is not one member of society who is incapable of increasing the general good. One, like the oak, is an example of intrepid fortitude, of unshaken constancy; another, who may not possess equal firmness, has a more gentle and complying disposition; he is as flexible as the willow, and yields to every zephyr; if his soul be virtuous, he will only give way in lawful, innocent, and indifferent points. If he be not actuated by those principles, he will always embrace the strongest side. However different the trees may be from each other, they are equally the property of the great

Sovereign of the Universe, are all cherished by the same earth, warmed by the same enlivening beams, and refreshed by the same fruitful showers. Would to heaven that human beings, however different in other respects, would with united hearts acknowledge their equal dependance upon the power and beneficence of the Supreme Being, as his creatures, and as being equally indebted to him for their existence and support, as well as for those talents with which his infinite goodness has pleased to endow them. The lofty cedar, which rises with such majesty on the summit of Lebanus, is as equally nourished by the juices of the earth, and the refreshing rain, as the briar which springs at his feet; and so is the divine blessing equally necessary to the happiness of the rich and poor.

The great and honourable among mankind should never forget the source from whence their grandeur springs, and that it is from God alone they derive their elevated station: he alone can preserve them in it. He could in a moment sap the foundation of their power, and degrade them to the lowest state. This thought will repress every proud emotion which may swell our bosoms, and fill us with a just and reverent submission to the great Author and Preserver of our existence in all his dispensations.

Oct. 15.

The Temperature in the different Climates of the Earth.

The temperature of different countries appears principally to depend on their situation with respect to the sun, as all places which are under the same latitude equally enjoy the benefit of its rays. But experience informs us that heat and cold depend on many other causes. In places in the same parallel the seasons may be extremely different, and on the contrary often resemble each other under very different climates. Thus as accidental circumstances may occasion the heat to be very unlike in the same latitude, and by no means so excessive as the distance of the sun would appear to promise, it is difficult to determine the exact seasons and temperature of each country. The proximity to the sea renders the climate milder; of which England and the coasts of Norway are convincing proofs.

The sea may be frozen near the shore, because it is mingled there with fresh water; but its saltness and continual motion prevents that from happening at any considerable distance from the land. The climate of the adjacent countries is rendered more temperate by the sea never being frozen in winter: on the contrary, the higher a place is above the sea the colder it is. The air is not only more rarified there, and consequently contains less warmth, but also the greatest part of the heat occasioned by the reflection of the sun upon the earth falls upon low

places and does not reach the more elevated spots. Quito is almost under the line, but from its high situation the heat is moderate. In countries which are covered with extensive forests, the air is generally excessively keen, the ice is longer melting in winter, because it is shaded by large trees; this makes the upper air cold, which delays the thaw. Another circumstance allays the excessive heat of the warm climates, their days not being long, the sun remains but a short time above the horizon; whereas, in colder countries the days in summer are extremely long, which renders them warmer than could be expected. The serenity of the sky, the light beams of the moon, and the twilight, render the long nights more comfortable.

Beneath the torrid zone the seasons are more distinguished by dry and wet weather than summer and winter; for in summer time, that is, when the sun is longer above the horizon, and its rays fall in a perpendicular line, the rains immediately commence, and continue more or less for some time. so that in those countries the most agreeable season is, when the sun is at the lowest. Beyond the tropic the weather is generally more variable than within it, and the winds are more boisterous in spring and summer. The ground is frozen more or less deep in winter, but in our climate it seldom exceeds three feet. In more northern climes the ground is frozen deeper in winter, and thaws but a few feet in summer.

The different qualities of the soil, in proportion as they retain more or less the acquired heat, in some degree occasion the variation in the climate.

What amazing wisdom and beneficence appear through all these wonderful plans in nature!

By thus regulating and adapting the seasons and climates of different countries, the great Creator has rendered the whole globe habitable. Every country has such an equal proportion of advantages and inconveniences, that it would be a difficult task to determine which deserves the preference. However, we may certainly draw this conclusion, that the goodness of God is displayed in every corner of the globe.

Oct. 16.

Atmosphere of the Earth.

The air with which the earth is surrounded is by no means so pure and subtle as ether, being encumbered with all those particles of thick vapours which rise continually from the earth, and especially from the water: this is stiled the atmosphere. That part which is nearest the earth, and is denominated the lower region, being oppressed by the upper air, naturally becomes thick and dense. This is proved by the experience of those who have ascended high mountains: their respiration becomes more difficult in proportion as they ascend. It is impossible, however, to ascertain the precise elevation of the atmosphere, as we cannot reach to any considerable height in the air. Neither can we draw a certain inference how far this mass of air extends, from the length of twilight; for if we conceive the morning

twilight to begin, and the evening twilight to end when the sun is eighteen degrees beneath the horizon, and that the latter twilight is occasioned by the rays which strike the earth, and reflected by the highest part of the atmosphere, there would still continue many difficulties to elucidate. The atmosphere is divided into three distinct regions: the lower extends as high as where the air receives no benefit from the rays reflected upon the earth; the middle region commences where the former one is ended, and reaches as high as the most elevated mountains or even as the highest clouds, and in that space where the hail, rain, or snow is collected. The cold is much more intense here than in the lower region, being only influenced by the rays which fall in a perpendicular manner upon it. But the third is probably still colder: it extends from the middle to the extremity of the atmosphere, but its exact limits cannot be precisely ascertained.

The particles and vapours which rise from the ground, and of which the atmosphere is composed, are of various natures: they are watery, earthy, metallic, and sulphurous. Now as some parts of the earth abound in these more than others, it occasions great variety in the temperature of the air; and this difference is very perceptible even at a little height. A dense air is more salubrious than a light one, beause the circulation of the blood and insensible perspiration are promoted by it. When the air is heavy, it is generally accompanied by great serenity, whereas a light one is constantly attended with clouds, rain, and snow, which render it very damp. The weight of the air is increased by

vapours, especially when they are carried very high by the heat of the atmosphere, however, is still light, notwithstanding the watery particles with which it is filled. Too great a drought parches up the human body, and is consequently very pernicious, but this seldoms happens except in dry and sandy countries.

A damp air is always very unwholesome, for it relaxes the fibres, and obstructs the insensible perspiration; and it is apt to occasion putrid disorders, if it be too close and warm at the same time. The heat of the air dilates the fluids of the human frame, and occasions perspirations which debilitate and oppress it. When, on the other hand, the air is too keen, it contracts the solids and congeals the fluids, which causes obstructions and inflammation. The most salutary air is that which is rather heavy than light, neither too dry nor too moist, and almost or entirely, free from noxious vapours. It is in the air that the clouds, the rain, snow, dew, thunder, and several other ethereal phenomena are formed; and the morning and evening twilight is produced also by the atmosphere. As its rays shoot through this mass of air, we perceive them before the sun appears, and we enjoy the benefit of them after it is sunk beneath the horizon. By this means the inhabitants of the pole are blessed with some cheering beams of the sun in winter, even after it is set.

The atmosphere is also the mansion of the winds, which have so great an effect on the fertility of the earth, and the health of mankind. If the air were constantly serene, with no storms and tempests to purify it and dispel those pestilential vapours which

continually rise in it, cities and provinces would soon be depopulated, and this world would be changed into a melancholy desert. What reason have we to bless the Almighty for this beneficial plan. If there were no atmosphere, or if it were different from what it is, this globe would be a chaos, and a melancholy place to inhabit. Let us acknowledge with gratitude and humility the wisdom and goodness of the great Creator, who has ordered every thing in nature so as to conduce in the highest degree to the felicity of his creatures.

Oct. 17.

Proportion between Births and Deaths.

It evidently appears from the exact proportion there has ever been in all countries among mankind, with respect to their entrance into the world, and their exit from it, that the Deity has not suffered the fate of man to be left to a blind chance, but that he watches over us continually with paternal care. By this means the due balance is preserved, and the earth is neither too empty nor too full of inhabitants.

The number of births generally exceed that of deaths; for it is computed, that for ten who annually die, there are twelve or thirteen born: thus the human species continually multiplies. If, on the contrary, the number of deaths was greater than that of the births, a country must necessarily be depopulated at the conclusion of a few centuries; particularly as many circumstances may prevent population, such as the plague, the devastation of

war and famine, celibacy, and, lastly, cities, especially if they contain a great many inhabitants, for in them there die at least as large a proportion as are born From the christening registers it appears, that there are more boys than girls born: it is commonly computed from twenty to twenty-one: so there are a thousand and fifty males to a thousand female children

But the equality between the sexes is restored by deaths in military pursuits, and many other accidental causes. In large cities there are commonly more women than men, and just the reverse in country situations. The number of children in families is also arranged with infinite wisdom; for it is observed, that in sixty-six families there are but ten children baptized in a year. In a populous country there is but one married every year out of fifty or fifty-four persons; and, one with another, each marriage gives birth to four children; but in great cities we generally reckon about twenty-five children from ten marriages. A fourth part of every country is composed of men capable of bearing arms.

In comparing together the registers of mortality in different countries, it is discovered, that in common years, when there has been no epidemic disease, there is one death out of forty in villages, one out of thirty-two in small towns, one out of twenty-eight in middling-sized towns, one out of twenty-four in large and populous cities, and one out of thirty-six in a whole province. There are twenty-eight annually die to a thousand that live. Out of a hundred children that die in the year, there are always three that came dead into the world and

there is scarcely one out of two hundred that expires in the birth. They compute that but one woman out of an hundred and fifteen dies in childbed, and but one out of four hundred in the pains of labour. The most precarious, and dangerous time with children is in the first year; about two hundred and ninety-three are generally lost at that age out of a thousand; but only eighty between the first and second year. In their thirteenth, fourteenth, and fifteenth year, the number of deaths never amounted to more than two: this then is the least dangerous period of life.

This earth would contain, at the same time, at least three thousand millions of inhabitants, but there is scarcely a third part of that number existing, or not more than a thousand and eighty millions at most, that is to say, six hundred and fifty millions in Asia, an hundred and fifty millions in Africa, an hundred and fifty millions in America, and an hundred and thirty millions in Europe. The most natural inference to be drawn from hence is, that it evinces the incomprehensible mercy of God, and that the life and happiness of his dependant creatures are precious in his sight.

If it be not for the operations of divine wisdom, is it possible that such an exact equality of births and deaths would be preserved, and their proportion continue so regular and constant at all times, and in every situation?

Oct. 18.

The disasters incidental to Nature.

Even this fair structure of nature, which, when blossoming in spring, delighted every sense, and afforded such an infinite variety of pleasures, is obnoxious to those common laws which govern all created things. Its beauty is now faded and disappeared, and every day causes some new revolution more melancholy than the former. Such, however, is the destiny of nature. It conceals within itself sources of devastation. Let us look around, and behold what distress is occasioned by the inundation of rivers, torrents of rain, and the melting of snow and ice: whole villages overflowed, fruit trees torn up by the roots, large flocks destroyed, and extensive crops buried beneath the water. Alas! these are the sad monuments of the destructive and irresistible force of this impetuous element.

A shipwreck appears to be a fatal disaster, as the devouring billows swallow up in a moment a sufficient number of men to have founded a commonwealth. Immense sums, which perhaps have been the fruit of many ages of industry, are buried in the deep. With what horror must it strike the mind to behold the tempestuous ocean, to hear the heart-rending shrieks of the dying, and the tremendous crash of the vessel when it splits to pieces.

Excessive heat and long-continued drought are also the occasion of great calamities: the grass and the plants are withered, the earth is parched up, and we are stifled with the burning sand; the waters by

degrees grow stagnant and corrupt, and become poisonous to the flocks. Heat and putrifaction give birth also to an immense number of insects, which are destructive to every thing before them; and if they die to-day, are succeeded by another generation to-morrow. Famine, the cruel companion of death, moves in their train, and is followed by the plague. Thus all these evils may be occasioned by one single bad year, a war, or an infectious disease. What confusion and destruction are caused by earthquakes, which are become more and more frequent! Pestilential vapours boil up in the very bowels of the earth, and a destructive fire spreads death on every side. Often on a sudden, in the dead of night, the earth trembles, whole cities are overthrown, and thousands of unhappy people are buried in the ruins. What an awful sight is a volcano! Here nature, which is so lovely, changes her appearance, and becomes terrific. Whilst I am contemplating this dreadful scene, I exclaim to myself, How imperfect is every thing but the great Creator himself!

The way to triumph over the desolations of nature is, to experience a sacred and true delight in the contemplations of his divine attributes, and to be sensible that he alone is our sovereign good. What also is so proper to excite our love and gratitude as to remember that he makes even these calamities conduce to our comfort? These apparent disorders in nature prevent infinitely greater evils, which would certainly happen if the destructive matter, such as subterraneous fires and vapours, were to remain collected and confined in the bowels of the earth.

When we are merely spectators of the evils which surround us, and are not personally involved in them, ought not our hearts to glow with gratitude to that great Being who has designed to spare us, and be filled with sentiments of commiseration and charity towards our unfortunate fellow-creatures? Let us never be insensible to the misfortunes of others, nor listen with indifference to the calamities of those people who are most remote from us, as if nothing was to effect us but what was actually related to ourselves. There is not a single link in the chain of earthly events which does not in a greater or smaller degree belong to each of us. Were these unfortunate sufferers greater sinners, or more deserving of punishment than we are? Why are they destroyed whilst we are still preserved?

Are those countries where earthquakes and volcanoes make such havoc more sullied with crimes than the places which we inhabit? The final catastrophe of nature will be still in another manner terrible to us. This world is not eternal. Having successively experienced every kind of evil, the moment of its total dissolution will at length arrive. Nature still flourishes, but grows visibly old. It is only by labour and industry that we extract those fruits from the earth, which it bore spontaneously for our ancestors, and which they gathered with little trouble. Perish then thou land of our pilgrimage, since thou art designed to perish. We have no permanent abode here: let us then seek that kingdom which is to come, eternal in the heavens!

To the end of time it will ever be the work of God to destroy and to create. If he never destroyed

we should never behold any new creation. We should experience no trials to prove our resignation and patience. We should not be so sensible of the infinite value of true religion which supports and consoles the mind under the most trying calamities, and exalts the soul above the sorrows of this transitory scene. Let this then be the result of our reflections, and let us always continue to cherish these sensations in our bosoms.

Oct. 19.

On the Circulation of the Blood.

Of all the various movements in the human frame, there are none more important and mysterious than the circulation of the blood. There is something so surprising in this motion, that it strikes the mind, renders us more sensible of the contracted limits of finite understandings, and inspires us with the profoundest admiration of the supreme wisdom of the great Creator.

The heart, which is situated near the middle of the chest, between the two lungs, is a muscular intestine, which forms two cavities, and are separated from each other by a partition. This machine is continually in motion, contracting and dilating by turns. From the left ventricle of the heart proceeds the trunk of an artery called the aorta, or great artery. This is soon divided into several branches, some descending, and others ascending. These numberless branches, which become smaller

and finer in proportion as they are farther removed from the heart, spread and disperse over every part of the body. The right ventricle, by contracting pushes the blood into these arteries with so much force, that it proceeds to the extremities of the smallest and most distant branches. This motion is stiled the pulses : it is caused by the pulsation of the heart, and is quicker or slower in proportion as that contracts with more or less rapidity. Certain arteries through which the blood circulates, absorb the aqueous particles, others the oily, and others the saline.

Where the arteries are dispersed in other parts of the human frame, the milk or fat is secreted, or other humours which are necessary for certain purposes, or are expelled from the body as useless.

That part of the blood which remains having been thus purified, flows into the extremities of the arteries in such a manner, that the small red globules may be distinctly seen with the assistance of a microscope rolling one after another. But these inconsiderable channels gradually increase, and form larger vessels, which grow wider by degrees, and are called veins. And thus by this wonderful contrivance the blood is conveyed back into the heart in the same way as it proceeded from it. These veins, therefore, carry back the blood to the heart from every part of the body, lower as well as upper, by a canal which opens a passage into the right ventricle. It does not pass directly into the left ventricle, but it is formed into the pulmonary artery by the contraction of the heart, and this disperses it through the lungs by an infinite number of ramifications.

Here the blood which has circulated throughout the body, has acquired such a degree of warmth by friction, that it is necessary for it to be cooled by the fresh air which is brought into the lungs by respiration, before the circulation re-commences.

Thus is the circulation of the blood performed, passing from the heart to the farthest extremities of the body by the assistance of the arteries, and returning again from the extremities to the heart by the veins. Such is the admirable mechanism of the circulation of the blood in men and animals! But how many obscurities still remain to fathom on this intricate subject! Here we are lost in wonder, which convinces us that the present confined state of the human understanding is incapable of perfectly comprehending this master-piece of divine wisdom. For instance, is it not amazing that the motion of the heart should incessantly continue for seventy, eighty, or an hundred years, and the machine neither wear out or decay? The circulation of the blood in the human body is performed twenty-four times in every hour, and consequently passes through the whole body 576 times every twenty-four hours; and as the heart propels two ounces of blood into the aorta at each contraction from thence it appears that 7,200 ounces, that is 600 pounds, of blood pass through the heart in the space of one hour. This alone may fill our souls with amazement, but probably there are many other wonderful circumstances in this circulation with which we are unacquainted, or of which we have but a very confused or imperfect idea. The most admirable mechanism and corporeal perfection are united in man. Every

member, every sense, declare him lord of the creation. An innumerable variety of invisible channels are formed, measured, and united in a manner which surpasses the profoundest skill and art of man to contrive, and which convey, disperse, and continually regulate the precious fluid, on which our frail existence depends. In this universal motion, this constant flux and reflux, the utmost order and regularity are preserved, every thing remains in its appointed situation, and the most perfect harmony exists. This order is preserved also in the revolutions of the celestial bodies, and throughout all nature.

The sun, moon, and stars pursue their destined course in a regular and certain motion. The air is not only in continual motion, but perpetually circulates round the earth: and the waters also roll on in an uninterrupted course. The rivers empty themselves into the ocean, and vapours continually arise from the vast surface of this tempestuous element, which are formed again into clouds: these descend in showers of rain, which penetrate into the mountains, and fill the springs with water, which increasing by insensible degrees, at length become rivers, and then return again to swell the ocean.

The fertile earth annually produces plants, and even yet its sources are never exhausted, as the continual circulation of nutritive juices repairs her losses, and restores to her what she bestows on us. But whilst we are surveying all these various revolutions in nature, let us direct our minds to the first great Cause who has so constructed this great fabric of the world, that every thing is in continual action.

Oct. 20.

Proportion of different parts of the Human Body.

God has constructed the human body with the utmost wisdom, preserved the most exact proportion through every part, and adapted every member to its proper function. To be convinced of this, we only need compute the height and breadth of the human frame by a certain settled proportion. The height of the body is generally divided into ten equal parts, which are denominated faces, according to the technical term; for a man's face was the first rule of these measures. The first includes the whole face, which begins at the roots of the hair above the forehead; from that point to the summit of the head is computed the third part of the face, of, which is the same thing, the length of the nose. So that there is a face and the third of a face in length from the crown of the head to the bottom of the chin. There are two-thirds of a face between the bottom of the chin and the hollow of the collar bones, and thus the height from the collar-bones to the crown of the head is double the length of the visage, which makes the fifth part of the length of the body.

Another face is reckoned from the collar-bones to the bottom of the breasts. The fourth commences below the breasts, and ends at the middle of the body; and the fifth is half the length of a man. Two faces are reckoned from the thigh to the knee,

and the knee itself is half a one. From the bottom of the knee to the instep is two faces, which in all make up nine and a half; and from the instep to the sole of the foot being half a face, it completes the ten faces into which the human body is divided. This division has been made for men in general, but persons who are extremely tall have half a face more between the breasts and the middle; and it is the superiority of height in that part of the body which constitutes an elegant figure. When the arms are extended in an horizontal direction, the distance between the top of the longest finger of each hand is equal to the length of the whole body. There is one face length from the hollow of the collar-bone to the joints which unite the shoulder-bone; when the arm hangs down, it is computed at four faces; two from the shoulder-joint to the elbows and two are reckoned from the elbow to the beginning of the little finger, which makes five faces for each arm, in all ten faces, which is the length of the whole body. The hand is one face; the thumb, as well as the longest toe, is the third of one, or the length of the nose.

The length of the sole of the foot is equal to a sixth part of the height of the whole body. There is also a particular measure to compute the thickness of the body and limbs. That of the finger is commonly the thirty-sixth part of the length, and the breadth of the little finger makes the forty-eighth part. The hand is three times as thick as the thumb, and the body six times as thick as the hand. The height of the human body is considerably different. The most lofty stature is from five feet four or five

inches to six feet two or three inches. The middle size is from five feet and an inch to five feet four, and a diminutive one is under five feet. Females in general are two or three inches shorter than men: their chests are higher, and project farther, so that the chest is thicker in women, and broader in men, in proportion to the size of the body. The human species have a larger proportion of brains than any other animal of an equal or superior size: they have even a greater quantity than the ox or horse. A man who weighs an hundred pounds, has in general four pounds of brains. Infants who are born in due time weigh eight pounds at most, and five at the least; one foot and eleven inches is the utmost length, and one foot six inches the least. Thus then we perceive that the human body, whether taken together or in distinct and separate parts, is formed by precise and unerring rules, and that the utmost harmony is preserved, both with respect to the size and form, as well as the disposition of its various members. Every thing is well proportioned; none greater or smaller than is required by their union and connection with other limbs, or the general design of the whole machine. Though certain disproportions in the size, formation, and disposition of the parts may not be absolutely incompatible with the principal purposes of them, yet they destroy the grace and beauty of the external appearances, and are unpleasant to the sight. Those then whose limbs are well-proportioned should with grateful hearts acknowledge this favour, and always devote them to the honour and glory of Him who is the former of them.

Oct. 21.

Navigation.

Navigation is a subject of so much importance, that it will give rise to many serious reflections in a contemplative mind.

Is it not surprising that so ponderous a mass as a ship should be borne with little danger and difficulty upon the surface of the water? The weight of a ship is greater than may be imagined, but it requires but little trouble to comprehend that its pressure on the water must be prodigious. A man of war, which is capable of receiving a thousand men, carries seventy or a hundred guns, and must generally be stored with three months provisions to support so large a multitude. Now if we reckon each man to weigh but an hundred pounds, and each gun but six stone (though there are some that are forty), and comparing each man to eat but three pounds a day, this moderate calculation amounts to 381,200 pounds weight. Still the weight of the ship is not included, with rigging and materials necessary to preserve it in a proper state, and to load the cannon. These articles will certainly equal the former sum. And is it not almost inconceivable and apparently contrary to the laws of nature, that this enormous mass should be moved by a very gentle breeze? And yet this is so natural, that it would be considered miraculous if it were otherwise.

This prodigious load is not borne on by the wind. The question then is, how this stupendous mass can sail on the water; the parts of which not being

united together, cannot have sufficient force or consistency to support so large a body. This effect is produced by equilibrium, the vessel sinks till the volume of water it removes is equal to its own size. Let us conceive the ship to be 120 feet long, and 15 broad, and that it plunges 2 feet deep, that is 3,600 feet of water, or that cargo weight, as one takes place of the other.

The art of navigation, in antient times, was not arrived at such a pitch of perfection, but was attended with more danger and difficulty than at present. They never ventured far into the open sea, but only sailed along the coast from shore to shore. But we cross the ocean with much more security since the invention of the magnetic needle. Before this invaluable discovery, it was considered a great exploit to make short sea voyages. In Homer's time it required great caution and immense preparations before the heroes resolved to cross the Ægean Sea. The expedition of Jason and the Argonauts to the island of Colchis was considered as a wonder of the world: but what are these in comparison to the long and distant voyages which our pilots make, by the assistance of the compass? The needle continually pointed to the north, informs the navigator the region he is in, and that towards which he directs his course.

Though many may not have reflected on the advantages of navigation, yet it is to this source we are, either directly or indirectly, indebted for a great part of the necessary subsistence of life.

The spices and medicines which are imported from distant countries could not be produced without

considerable trouble and expense, if they were no conveyed into our harbours by trading vessels.

It would be a great inconvenience if every thing were obliged to be brought by land; the following calculation will prove the truth of this assertion. The freight of a ship is reckoned by tons; there are many which bear 600 tons. A ton weighs 2,000 pounds. Thus a ship of 600 tons carries 1,200,000 pounds. Now, allowing 1,000 pounds to each horse, it would require 312 four-horse carriages, at least an equal number of men, and 1,248 horses to carry that weight. But then commerce also would be interrupted, we should be unable to obtain the produce of other parts of the world, and even the common necessaries of life would be very expensive. Besides, should not navigation be considered as an inestimable blessing, when we remember that it is the means of diffusing the knowledge of the sublime truths of the gospel to the remotest nations of the world? This consideration alone must inspire us with the liveliest emotions of gratitude to the Supreme Being.

And ought we not also to be thankful to Him that our situation does not oblige us to brave the dangers of the sea in the pursuit of riches, or even the scanty mean of a bare subsistence? Whilst we are from these dangers, and enjoy in peace the society of our families, should we not implore the protection of the Almighty for our fellow-creatures, who are compelled to undertake long and dangerous voyages for the benefit of society, and consequently for the profit of every individual in particular?

Oct. 22.

Beasts of Burden.

This species of animals are so very serviceable to us, that it would be ungrateful not to examine their various properties, and consider them worthy our attention. The horse is the most profitable of all domestic animals, and performs his work with less constraint than any other: he suffers himself to be employed in the cultivation of the ground, and brings us all the necessaries of life; he tamely submits to the most laborious work, and is rewarded only with a frugal and moderate subsistence. He shares with man the pleasures of the chace, and the dangers of the martial field, he is a creature entirely resigned to his master's will, and apparently anticipates his commands by the quickness and precision of his motion, and by this means expresses and executes them. He never refuses his assistance, but will employ his utmost strength, completely exhaust it, even die in his master's service.

The horse has a natural propensity to love and fear mankind, and is very sensible to their caresses, which mitigate his toil, and render his labours pleasing. He excels all animals in the proportion of his limbs and the beauty of his form, every part is elegant and regular; the exact proportion of his head gives him a light and sprightly appearance, which is heightened also by the beauty of his chest. His carriage is stately and noble, his step majestic; and

animation, strength, pride, and intrepidity are marked in every limb.

The ox does not possess the pleasing elegance of the horse, but he is strong and hardy, can bear heavy burdens, and is contented with poor provisions. His blood, his skin, flesh, fat, and horns, are each applied to separate purposes; and his dung is excellent manure for enriching the ground. This animal is remarkable for the construction of his organs of digestion: he has four stomachs, the first of which is sufficiently large to contain forty or fifty pounds of food; the third stomach has eighty-eight folds which assist the digestion: while the sheep and goat have but thirty-six.

Though the ass may be destitute of beauty in his external appearance, yet he possesses many excellent qualities, and is very serviceable to man. He has not, indeed, the fire and impetuosity of the horse, but is quiet, simple, and obedient: he has no stateliness, but proceeds with a steady pace, and bears his load without resistance or ripening: he is equally temperate both with respect to the quantity and quality of his food; thistles are his fare, and he is satisfied with the coarsest vegetables; he is patient, laborious, and indefatigable, and is of constant and essential advantage to his owner.

It is worth the attention of every reflecting mind, that the number of domestic animals far exceeds that of wild beasts. If the latter increased as rapidly as the former, this world would be a desert waste. Must not our hearts glow with gratitude to that infinite goodness which has bestowed on us the government of these animals, sufficient skill and

strength to subdue them, an entire dominion over their natures, to model them as we please, to compel them to implicit obedience, and to employ them in the most necessary and laborious work?

We are indebted for this power to God, which is a still farther proof of the excellence of his attributes. If God had not impressed these creatures with an instinctive fear of man, we should be unable to subdue them by force. Since then it is the Deity who has given us our influence over them, we are guilty of an unpardonable fault in abusing the trust reposed in us by our harsh and brutal treatment of them.

Oct. 23.

The Winter Sowing Time.

At this period great part of the food which is destined for men and animals is deposited in the ground. The farmer has sowed his winter corn, and enjoys some respite from his former labours.

The fields are gradually covered with a beautiful verdure, and his heart exults with the delightful prospect of a plenteous harvest. Nature is unfolding her treasures; but at first her operations are performed in secret, yet they may be discovered by taking some of the grains from the earth when they begin to shoot. When the grain has been two days in the ground, it is swelled by the nutritious juices of the earth, and begins to open. The germ is always placed at one end of the plant, and that part which is nearest the outside of the grain is the

embryo of the future plant; that part turned inwards is the stalk and head. When the corn has been sown twenty-four hours it begins to burst the coat, and disengages itself; the root and stalk appear, the former of which is enveloped in a sheath, which it bursts open. In the course of a few days other roots shoot out at the sides, and disengage themselves from their coverings.

The fifth or sixth day a green blade appears above the ground, and remains in that state till the fine season advances, when the ear bursts forth from its coat, which had protected it from the cold and inclement weather during the rigours of winter.

This progressive advancement in the vegetable world naturally leads us to reflect on the nature of human life. Our present existence is but the germ from whence an everlasting life is to spring; this is our seed time; and at present we can perceive but a very small and imperfect growth. In this state the corn or fruit will arrive at maturity. We live in hope of a glorious harvest, but it will not be reaped on earth.

The farmer has planted his seed, and consigned it to corruption, rain, storm, and scorching heat. Unacquainted with the recompense he shall receive from the toil, and the result of his care and anxiety.

This is entirely similar to the state of the spiritual seed. Let us not boast of what we have sown, nor be discouraged if we reap not immediately the produce of it. Let us never be weary of sowing to the Spirit, and possibly our righteous works, however inconsiderable, may be productive of future beneficial consequences.

When we have planted the seed, and done every thing in our power, let us leave the result to God and wait with patience and contentment till we receive the reward of our toil; and, like the pious farmer, implore his blessing on our earnest endeavours.

Oct. 24.

The particular Providence of God.

It would be a melancholy consideration for the world if there were any foundation for the opinion of Deists, that there is no particular superintendence over the affairs of individuals, but only an universal providence for the protection of the species in general. Is not the Deity of infidels unworthy the title, if he possesses neither the power nor inclination to preside over every distinct part of the creation he has formed, nor interests himself in the happiness of each of his dependent creatures.

But reason and revelation afford us indisputable evidence of the universal and special government of God, that his protection is extended to each of his creatures; and from thence we may draw the purest springs of consolation. Let us not say, that it is beneath the dignity of the Almighty to attend to the various concerns of individuals. The whole universe is but a particle of dust in comparison of the supreme excellence of Jehovah.

What can be called mean or contemptible? Is there not less difference between one man and a whole nation, than between a whole nation and

these immense globes, which appear so inconsiderable in the eyes of the ignorant multitude? A moment's reflection must convince us that in the sight of God, to whom a thousand years are but as a day, and the whole universe but as a drop in comparison with the ocean, there is nothing in itself either great or small, or any event, however trifling, unworthy his notice.

If we examine the smallest plant, or the least insect that can be dissected, we shall perceive the same wisdom displayed in the minutest part which appears in the construction of the whole. The smallest fibre contributes equally to the perfection of the whole plant or animal, as they conduce to the perfection of the whole species, or the whole species to the order and perfection of nature. If the Deity has deigned to create these apparently despicable creatures, why should he consider them beneath his protecting and preserving care?

The light of reason is sufficient to convince us of God's universal care, but the brighter beams of religion confirm it. That assures us, that even the hairs of our head are all numbered. From thence our Blessed Saviour draws the following conclusion. That with much greater reason we may expect the divine interposition in more important matters, and that he will vouchsafe to honour us with his special notice. Teach us, O God, when we behold the directions and designs of thy providence, to adore thee with the liveliest faith and most heartfelt gratitude! Let me confide in that providence which the infidel would persuade me from believing; let me remember that its mysterious ways will be un-

veiled with all their splendour in another world, and that this is a transitory state, full of ignorance and guilt, and which we are shortly to leave. Let us be astonished at the infinite condescention of the Almighty that he deigns to think of us.

What is man that thou art mindful of him, and the son of man that thou visitest him? Should not these motives stimulate us to a perseverance in a religious course, and induce us to guard against every appearance of evil.

Never suffer us to be stumbled by the obscurity of thy ways, but may all the dispensations of thy providence terminate in our everlasting salvation through Jesus Christ.

Oct. 25.

The Measure and Division of Time.

Time is measured and divided according to the motions of the celestial bodies, more especially by the revolutions of the moon, and the apparent course of the sun round the earth. These two globes have the most material influence on the state of our world. The course of the moon is only calculated in a partial degree to measure the time on our earth; and that of the sun most undoubtedly regulates what we denominate time, from the nearest to the remotest planet which belongs to our system. Four and twenty hours is the space of time in which the sun makes its diurnal revolution round the globe which we inhabit; or, to express it with more propriety, according to the principles of the Coper-

nican system, which is now indisputably established, it is the period of time which our earth requires to revolve on its own axis. That portion of this time during which the sun is above the visible horizon in any part of the globe, is called artificial day. This is when the light is determined by the rising and setting of the sun. The time of darkness, or that space of time during which the sun disappears beneath the horizon, we call night. The day and night together constitute the solar day, which, as I before observed, we again divide into twenty-four equal parts, which we call hours. Each hour is again divided into sixty equal parts, called minutes; each minute into sixty seconds, and each second into sixty thirds.

This division of the day into hours, minutes, &c. is well expressed by the regular motion of the shadow on a sun-dial, or by the hands of a clock. A good sun-dial is to be preferred, as it marks the hour with invariable precision; while a clock or watch, though, perhaps, the most ingenious piece of mechanism which the persevering industry of man ever produced, is liable to perpetual accidents, and, even independent of them, frequently requires renewed regulation. Most Europeans, in common life, begin their hours of the day at noon, from whence they reckon twelve to midnight, and twelve more to the return of noon. The Italians begin the day at sun-set, and reckon twenty-four hours from thence to the following evening. The Turks begin their day a quarter of an hour after sun-set; they reckon from thence welve equal hours, and when they are

elapsed, they reckon twelve more to the following evening. The Jews commence the day at sun-set; from thence they reckon twelve equal hours to sun-rise, and the same number again to sun-set; consequently their hours of the day are longer or shorter than those of the night in proportion to the varying length of the day and night. A week comprehends the space of seven days. A solar month is the time the sun requires to traverse one sign of the zodiac; but those months do not commence or terminate precisely as that body enters a new sign. The lunar month occupies the space of time between two new moons, that is, twenty-nine days, twelve hours, and forty-four minutes. The solar year includes twelve solar months, which is the time of the sun's progress through the twelve signs of the zodiac; and we generally reckon in that time three hundred and sixty-five days, five hours, and forty minutes. This period of time constitutes the year, now commonly used in most parts of Europe. Our common year begins ten or twelve days after the sun has entered Capricorn. This various division of time however unimportant it may appear in itself, becomes a subject of very material consequence, if considered with respect to the moral application of it, as connected with the present state of existence in which man is placed. The hours, days, weeks, months, and years, of which our mortal life is composed, are gifts bestowed on us in order that we may fulfil the grand design of our existence, by employing our faculties in that way which will be most beneficial to others, and productive of happiness to ourselves.

But alas! to what different purposes do we devote

these precious hours, in what manner do we employ this inestimable blessing? Minutes we regard as too trifling to merit our attention, yet it is too certain that he who suffers minutes thus to pass unheeded, or unimproved, will lavish hours with the same thoughtless extravagance. But do we even value as we ought more considerable space of time? Alas! if from all the days allotted us on earth, we were to deduct those which, with respect to our immortal souls, and the most important concerns of man, as a rational being, have been almost lost, what number would remain? From this calculation may we not compute, that a man of seventy has wasted more than fifty years, and that one at fifty could scarcely reckon seven which he has employed for the advancement of his real, his eternal happiness.

O merciful God! what a mourful, what a mortifying reflection! How many thousands of days and hours, bestowed on us by the kind paternal hand, have been shamefully consumed in the lap of indolence, or devoted in obedience to the tyrannic sway of vice, in submitting to the impulse of criminal passions, and offering injuries to our fellow-creatures! With what inconceivable rapidity does time glide away! A fast fleeting hour is fled, for ever fled, ere we perceive the irrecoverable loss; and one single hour is much to man, who can with the utmost facility number the hours of his life. "Teach us, O Lord, so to number our days, that we "may apply our hearts unto wisdom!"

Oct. 26.

The end of Summer.

The sun is now shedding his farewel summer rays upon the earth. Nature has entirely altered her appearance; and though so lately beautiful and fertile, she is gradually degenerating into poverty and sterility. We are no longer gratified with beholding the verdant foliage of the trees, the charms of blooming spring, the magnificent and varied scenes of summer, the rich and different tints of the grove and mead, the purple clusters, or the golden harvest which crowned our fields: the trees have lost their covering; the pine, the elm, and even the stately oak, yield to the violence of the northern blast. The beams of the sun are too feeble to warm the atmosphere and penetrate the earth; the fields, which have been so generous in their gifts, have exhausted their annual store, and promise no further produce till another year.

These melancholy changes must naturally excite similar sensations in the heart, and diminish the pleasures of mankind. When the earth has lost its refreshing verdure, its vivid colours, its brilliant appearance, and its boasted glory, when the eye is presented with nothing but a moist soil, and dark and gloomy tints, we are deprived of the pleasure we obtain through the medium of sight. When the earth is stripped of its corn, grass, and herbs, nothing is visible but a rugged surface; that beautiful variety which is produced by the assemblage of corn, greens, and vegetables, no longer charms the eye.

The feathered songsters have ceased their warbling, and nothing reminds us of the universal joy which reigned through all animated nature. We hear no sound but the murmuring of streams and the whistling of the wind, which create the most gloomy and disagreeable sensation in the mind of man. The fields have lost their fragrance, and we inhale a damp and disagreeable smell. A moist and heavy atmosphere is unpleasant to the feelings. But amidst these melancholy prospects, let us remark with what fidelity nature obeys the irrevocable laws prescribed her, of being beneficial at all seasons and every period of the year.

Winter approaches with hasty strides, the flowers fade and die away, and even when the sun sheds his animating beam, nature appears no longer decked with her wonted beauty. Yet, however naked and barren she may appear, the feeling mind is still presented with the reflected image of happiness. Our hearts glow with gratitude to heaven, when we recollect, that though now the fields appear so sterile, they lately waved with golden corn, and produced a plenteous harvest. The leaves of the fruit-trees are fallen, the grass of the meadow is withered, dark clouds obscure the sky, and fall in heavy rains; the thoughtless man complains of this, but those who are possessed of wisdom and knowledge behold the ground bedewed with fruitful showers with infinite satisfaction. The withered leaves and faded grass form manure to enrich the earth, when prepared by the autumnal rain. This reflection, mingled with the pleasing anticipation of returning spring, must excite the most lively gratitude to our beneficient

Creator. Though the earth has lost its exterior charms, and is exposed to the murmurs of these ungrateful beings it has cherished and preserved; yet already in its bosom it has secretly renewed its labours for their future benefit.

Why is not the moral world equally faithful in the fulfilment of its destination as the natural world? An oak springs from an acorn, and the vine produces grapes. Why then are not the talents of the great and wise inherited by their offspring? and why does the artist and the man of learning, whose knowledge has rendered them such blessings to society, so often leave behind them such ignorant descendants, in every respect unworthy of them? When reflecting on this incongruity, we may discover that it proceeds from several natural causes; and it is evident, that similar accidents occur in the natural as in the moral world.

Or to carry my reflections still farther, I take a retrospective view of myself, and exclaim. Have not my brightest days been obscured, and has not my former splendor vanished and disappeared like the foliage of the trees? Perhaps our earthly destiny has its various seasons.

If this be the case during the gloomy winter of my life, I will have recourse to these provisions which I have treasured up in my happier days, and endeavour to improve the fruits of education and experience. Happy if at the termination of my present existence I bear with me to the silent tomb the sweet remembrance of having performed the task allotted me to the honour of God, and the benefit of society.

Oct. 27.

The magnificence of God in the Creation.

"God has manifested himself in the creation as a "being of infinite wisdom!"

Every creature he has formed, however small and insignificant it may appear, is capable of some utility, and is most properly adapted to the purpose of its existence. This is evident respecting those creatures with which we are acquainted; and from analogy we may draw the same conclusion as to those of which we are ignorant. If we descend from the sun to the meanest worm, or the smallest plant, we shall perceive that nothing could be better adapted to the separate ends assigned them. The minutest parts are formed for their proper functions, and the whole creature would be defective and imperfectly answer the end of its existence, if we were to injure or deprive it of the smallest part. How wonderful is the effect that results from the union of all created beings! each fills its proper function, its appointed office, and the whole would be rendered in some degree imperfect by the failure of any of these functions. When we contemplate the Being who created this countless multitude of animate and inanimate creatures, and who assigned to each its particular end, must we not be struck with amazement, and exclaim with holy admiration, Oh! the depth of the wisdom and goodness of the Almighty!

"God has manifested himself in the creation as a "Being of infinite goodness!"

The beneficence of God is displayed in the multitude of beings he has endowed with the faculties of enjoyment. But existence is of little benefit where they are immediately deprived of it; the Creator has therefore ordained them that length of life which is necessary for their proper destinations. He has allotted them their separate habitations, and they find every thing that the preservation of existence requires at their first entrance into the world.

Many animals are born with sufficient industry and instinct to provide their own subsistence, but others, like mankind, are protected and taught by their parents.

The Deity has rendered the earth inexhaustibly productive to conduce to the comfort of mankind. For how long a period has it supported millions of men and animals? And if this globe were to subsist to the most distant period, it would still continue to supply the future generations. The Almighty has not only bestowed life, but a pleasing susceptibility to the tenderest sensations and most refined enjoyments, and in this respect he has particularly favoured his creature man. With what magnificence has he embellished this habitable globe! what pleasures are derived from the charms of social endearment! what tender and indissoluble bonds unite congenial souls! what warm and lively affections inspire the human breast! what tender sentiments the heart is capable of enjoying

Shall we be ungrateful to this bountiful benefactor? Ought we not rather, who are endowed with reason, and are capable of comprehending the infinite mercy

of the Deity, to acknowledge with pious gratitude that "the earth is full of the mercies of the Lord!"

"God has manifested himself in the creation as a "Being of infinite power!"

This supreme and unlimited power is visible throughout creation, but especially in these two extremes, the greatest and the smallest works of the universe. What but an omnipotent arm could have built the spacious firmament, that vast extent, that prodigious space, which contains such an infinite number of celestial worlds? What but an omnipotent arm could still preserve this immense fabric, and continue it firm and unshaken, and yet maintain so many various, yet stated, revolutions in it? What but an omnipotent arm could fix the sun in such an elevated station, mark its determined and undeviating bounds, and maintain it unsupported in the wide expanse! What but an Almighty power could give motion to the earth, the moon, and stars so that they run their destined course by unerring rules, and begin and finish their various revolutions at their appointed period! If we contemplate the omnipotence of God, we shall perceive that it is equally incomprehensible in the smallest as in the greatest objects. Let us survey the dust we tread beneath our feet: this dust is inhabited by innumerable multitudes of animals, so extremely small, that many thousands of them united together would not equal a grain of sand in size; yet each of these animals possesses its external members and internal organs, its peculiar instinct, is endued with love of life, and endeavours to preserve it.

Behold the grass of the mead, the hairs of your head, the blossoms of the trees, and examine their formation, their origin, and their utility, and you shall every where perceive new wonders, and be led to acknowledge the infinite power of that Being who can with equal facility create celestial globes as he can form a worm and cause a blossom to spring forth. "Lord, how great and numerous are thy "works! in wisdom hast thou made them all, and "the earth is full of thy goodness!" O may these reflections excite our fervent love, mingled with respect and confidence, towards the supreme Being who is infinite in wisdom, beneficence, and power.

Oct. 28.

Law of Inertia.

Inertia is nothing more than the power of resistance, through which all bodies have a propensity to remain in that state in which they are. When any body is at rest, it resists the motion we desire to give it; but when put into action, from the same cause of inertia it persists in it, and with equal force repels those bodies which first put it into motion.

Nothing can be a greater proof of the Creator's wisdom than this law which he has enacted. By this means bodies move with unerring regularity, and the laws of motion and precision are exactly determined by it.

If the celestial bodies did not possess the force

of resistance, they could not revolve with their present order and regularity, but would perpetually require some new stimilus to preserve them in motion.

From thence it is evident that infinite wisdom formed and arranged this universe. If the smallest part of this immense fabric were suppressed, it would create confusion in the whole. The curious structure of plants and animals, and the admirable arrangement of the celestial globes, would be of little benefit to mankind if they were not susceptible of motion. How simple does this law appear, and yet how surprising are the effects resulting from it! Such are the works of the Almighty, though the principles are so simple yet the whole edifice is in proportion the more admirable. This universe resembles a magnificent palace: the rugged walls which encompass and support it, though they boast neither elegance nor beauty, are yet so absolutely necessary, that without them the tottering building would be overthrown by a breath of wind.

Yet even those rough foundations are not entirely devoid of beauty, though none but the architect's eye can discern it. A person must be well versed in the rules of art before he can be capable of tasting the pleasures which result from the exact symmetry and construction of foundations. The artist only can comprehend why the foundation has the depth, breadth and length which the architect has thought proper to assign it. He perceives that it would be erroneous if it were otherwise: he has the satisfaction of forming a right judgment of it, and he is sensible of the perfection of the work. This

is precisely the case in the contemplation of the works of God. Every spectator is not capable of perceiving the fundamental laws on which most of the phænomena depend, or of conceiving the infinite wisdom which is displayed through the whole plan. This discovery is reserved for the true philosopher, and is a source of inexpressible pleasure to him. The mind appears to be influenced by the laws of inertia as well as matter. Bodies which continually pursue the same track, and the same point, appear to have a natural tendency to it. Thus the human mind has a certain propensity towards those actions which by frequent repetition have been formed into habits, and those are extremely difficult to conquer.

Surely we might employ this property of the soul for the most excellent purpose, by making it subservient to our spiritual welfare, and by confirming us in a virtuous course. Nothing is necessary for this purpose but a constant repetition of virtuous actions, till they become equally familiar and natural to us as vicious ones are at present. This is of infinite importance; for without the possession of virtue and religion nothing can afford us true and solid tranquility.

But from whence arise the mistakes which we frequently make in these respects? Why do we constantly pursue the visionary pleasures of this world, which end in total and everlasting perdition? Our hearts are seduced by inherent pride, and dazzled by the flattering splendour of sensual enjoyments; these make us enter a virtuous path with reluctance. Let us not be discouraged if we have a hard struggle with

our inclinations and passions. The wicked are often obliged to restrain themselves to obtain some temporal advantage, or to avert some misfortune, and the efforts they must make to resist their sensual appetites and desires must be extremely painful to persons of vicious habits: and oh! how sweet the satisfaction that is derived from a conquest over our evil inclinations, and when our souls resume the command over our senses. A frequent exercise of this authority may at length conduct us to that happy realm where (if I may so express myself,) the spirit is exalted above the tumult of contending passions, and surveys with commiseration the swarm of mean and despicable slaves of wickedness.

Oct. 29.

The Wants of Man.

THERE is no creature in existence that has so many wants as man. We are brought into the world naked, destitute, and ignorant: we are not endowed with that natural industry, or those instinctive powers which other animals possess at their birth. Reason has been bestowed upon us, that we might acquire the talents and information which are requisite. In this respect the situation of the brutes may appear enviable. Is it not a great happiness for them to require neither the dress, instruments, or conveniences which are indispensibly necessary for us? and to be exempt from the trouble of inventing and labouring at the multitude of arts and trades, without which we could not procure the necessaries

of life? They are furnished at their birth with clothing, arms, and every thing they need, or they can easily obtain them by means of that natural instinct which they implicitly obey. If they want habitations, they know either how to dig or build them. Have they need of beds, of covering, or change of raiment? they can spin or weave them, cast off their old garments, and procure new ones.

They are provided with defensive weapons to protect them from their enemies, and they know where to seek for proper remedies if they are sick or wounded. And man, who is superior to all other creatures, has more wants and fewer means of satisfying them. It may be asked, why the Almighty has privileged the brute creation above mankind? and this curiosity is doubtless allowable, if it be not attended with a murmuring spirit.

By subjecting man to a greater number of wants the Deity has designed to exercise that reasoning faculty with which he has endowed him, to conduce to his happiness, and which amply compensates for the want of those resources which other animals possess. And as we are destitute of the instinctive powers which are granted to them, we are obliged to employ our reason to obtain a knowledge of the world and of ourselves, to render us active, diligent, and laborious, to preserve us from poverty, pain, and disappointment, and thus ensure a tranquil and happy life.

It is our reason which convinces us of the necessity of restraining our impetuous passions, and avoiding those excesses which terminate in fatal consequences. A few examples will convince us of

this. If we obtain a subsistence without industry, we should infallibly degenerate into indolence, and pass our lives in the most degrading inactivity. The noblest faculties of man would be enfeebled and stupified; the bonds which unite society would be broken, as men would no longer live in a state of mutual dependance. Children would not need the assistance of their parents, and still less the help of others, the whole human race would fall into barbarism and stupidity; each, like the brute, would live solely for himself, and study nothing but his own happiness. There would be no subordination, no mutual obligation, or tender offices. It is then to our wants we are indebted for the expansion of our faculties, and the prerogatives of humanity: they rouse the mind, inspire it with activity and industry, and thus our situations are rendered more easy than those of other animals.

Our wants have given us a sociable rational temper of mind, and great regularity of manners; it has led us to the discovery and invention of many beneficial arts and sciences; and, in general, an active and laborious life is both useful and necessary to man. If he never exerted his faculties, they would prove a burden instead of a blessing; he would gradually fall into the profoundest ignorance, the most brutal excesses, and all those vices which always result from them. On the contrary, labour puts the whole machine into a pleasing state of action, and the satisfaction and happiness derived from it are proportionate to the invention, reflection, and knowledge it requires. If we needed no further succour or instruction after we have been cherished with

our mother's milk, all our wishes and desires would centre in ourselves, as we should learn no language, suffer our reasoning powers to lie dormant, we should be totally ignorant of ourselves and others, be unacquainted with the arts and sciences, and be strangers to the noblest pleasures of the soul. Whereas the helpless state of infancy, and its numerous wants, excite the tenderness and affection of the parents, and insure their protection and support; and on the other hand, the children become attached to their parents, and, being sensible of their own helpless and destitute situation, they submit to be ruled and formed by their instructions and examples, to make a proper use of their reason, and to respect morality: thus they become worthy people and good citizens, and are enabled to obtain an honest and peaceful lot.

Surely, with these superior advantages, we may easily resign those which animals appear to possess over us. We do not require furs or feathers to cover us, teeth, or talons to defend us, or those natural instincts to procure us the things which are necessary to our support. These gifts of nature would degrade us to a level with the brute creation, and bring us into a state of mere animal perfection.

Our senses, reason, and hands are sufficient to procure us clothing, weapons, and sustenance, and every thing that can conduce to our safety, support, and gratification; and enable us to reap advantages from the treasures which nature bestows. We therefore perceive that those wants of which we complain, are the very basis on which our civil hap-

piness depends; the surest means which the wisdom and goodness of the Almighty could appoint to direct the faculties of man to their greatest advantage. We should prevent many direful sorrows if we were wise enough to exercise ourselves by this rule. Not one in an hundred of the unhappy could attribute his distress to misfortune: and we should allow that there is a larger proportion of good than evil in the world, that our afflictions are alleviated by a thousand advantages, and that we may enjoy not only a tolerable but a happy life.

Oct. 30.

On Presentiment.

The faculty of the soul, by which we are enabled to foresee future events, discovers itself in such various and wonderful ways, that it must strike the mind with astonishment. The sensations and representations which occasion presentiment are often so obscurely enveloped in the mind, that we are unconscious of them. However, the soul infers exact conclusions from them, and the image of the future is presented to our view with sufficient perspicuity to convince the mind that is endowed with this preconception.

It forms conjectures, and presages without being acquainted with their origin, and while lost in wonder, often mistakes them for inspiration.

This is what we call presentiment, when we have a fainter or more distinct idea of any event without

being able to discover the manner in which we foresee it.

But as presentiments are naturally much fainter representations than sensations, it must be observed that they cannot be well distinguished when the mind is violently agitated by the senses, or by a heated imagination. They are generally more distinct when the mind is in a composed state; hence is it that they are principally observed in the silence of night in sleep, or in dreams. Man is then, sometimes, elevated above himself; the veil is drawn aside which conceals futurity from his view, and he speaks of future events while he hardly perceives those objects which are passing directly before his eyes. This faculty of the soul, of sometimes foreseeing the future, is indispensably proved by a variety of facts. Our knowledge of nature must be very limited, if we deny a thing solely on account of its extraordinary and inexplicable appearance. This secret emotion of the mind, which sometimes warns us of approaching circumstances, is an innate principle of the soul: and history is so replete with examples of this kind that the most credulous can hardly disbelieve them all.

Few persons have attained to riper years without experiencing some of these presentiments. The soul is a representative power of the universe, with respect to the situation it holds in it: it is capable of representing the past as well as the present; why then may it not have the power of perceiving the future, and even contingent circumstances? To attain this end, it may employ the same means it did in respect to the past. If it be acquainted with past

events, it can perceive them as present; why then should it be deemed impossible that the mind should also have a preconception of future events? The universe contains millions of intelligent beings far superior to man, who may unveil to him some portion of futurity; or there may be some latent faculty in the human mind which enables it to foresee remote events. Yet however obscure and inexplicable the origin of presentiment may be, it is sufficient for us to be assured that, directly, or indirectly it may conduce to our happiness. Sometimes it warns us to prepare for approaching evil, and sometimes it predicts a pleasing and happy event. In either case the warning may be beneficial to us. However, we must be careful that this faculty of the soul does not prove a torment, but to subserve our comfort, and to confirm our tranquillity. We should especially guard every avenue against the inroads of superstition; we should not place too great a dependance upon our presentiments, so that they render us negligent in the performance of our duty, or lead us to forget that Almighty Being, in whom alone we ought to put our trust and confidence.

Oct. 31.

The Heavens declare the glory of God.

If we wander in the mazes of vice and error, we cannot plead in our excuse the want of warning and instruction; for the mind which is disposed to learn has the fairest opportunity for both. This world abounds with objects calculated to inform and cor-

rect us. All nature tends to give us grand and lofty ideas of the God whom we adore! All the works of the creation declare that he is equally worthy of our respect, admiration, and obedience! All animated nature proclaims with intelligible language, his wisdom, power, and majesty! But especially the heavens, with all the celestial orbs, the sun, the great source of fecundity and life, celebrate with superior eloquence the glory of their divine Creator. Yet these objects, which are so deserving the attention of every rational mind, are disregarded, and seldom employ our thoughts. When man had nothing but the light of nature to direct his discoveries respecting the existence of a Deity, yet from this alone, from the contemplation of the works of creation, especially the lofty structure of the firmament, he inferred this natural consequence, that there was a supreme Being. "When we be-" hold the heavens (says Cicero,) when we con-" template the celestial bodies, can we fail of con-" viction? Must we not acknowledge that there is " a Divinity, a perfect Being, a ruling intelligence, " which governs; a God, who is every where, and " directs all by his power. Any body who doubts " this, may as well deny there is a sun that lights us. " Time (says he) destroys all false opinions; but it " confirms those which are formed by nature. For " this reason, with us as well as with other nations, " the worship of the gods, and the holy exercises " of religion, increase in purity and extent every " day." This is a convincing proof of the admirable effect which has been produced in all ages, by a contemplation of the celestial bodies. Well might

the royal Psalmist conceive the heavens to possess voice and language, for they compelled the nations to acknowledge that they were formed by an Almighty arm, a supreme and over-ruling power. "The heavens declare the glory of God, the firma "ment sheweth forth his handy works!" We may consider the heavens in different points of view; the first general and superficial; the others, more particular; and it should be surveyed with great attention. The first is free to all who are endowed with sight: they only need contemplate the spangled sky, with all its grandeur and beauty. The husbandman, while returning from the labours of the field, is witness to this magnificent spectacle, and every day may listen to the language of the heavens: though he is unacquainted with the wonderful construction of this firmament, which attracts his eager gaze, and excites his admiration; though he is unable to make philosophical observations upon it, yet he is led to ask "What power has framed "this stupendous fabric? If it be of solid matter, "who is the great Architect? What hand suspended "these refulgent orbs, and placed them in their "present order? and who directs their stated revolu- "tions?" Good sense alone would give rise to these questions, and the same good sense would answer them. But, if I may be allowed the expression, the heavens have in latter ages been compelled to address us in more striking language, Still more convincing demonstrations of the majesty of God have been extorted from them.

While we survey this vast expanse, our finite understandings are astonished and confounded.

Heretofore our ideas upon the subject were much more confined, but now, while we compare our earth to the stars, we discover that it is one of the smallest globes in the universe, and that there are millions of superior size. Let us conceive the immense space it must require to contain such multitude of bodies, among which our earth appears but as a speck, and yet they continually perform their various revolutions without ever interfering or coming in contact with each other. How does this first idea elevate our conceptions, with respect to the omnipotence of the Deity! How can we reflect on these vast regions of ether without the most profound admiration of that Being who fills them with his immensity, and whose power extends to the farthest limits of the universe! But, secondly, the innumerable bodies which appear in this vast expanse, some of which shine with their own, and others with borrowed lustre, may give rise to still farther reflections. Without determining that point whether or not the fixed stars be suns to illuminate other worlds, it is sufficient for us to be certain that God has created nothing in vain; from whence we may infer, that these bodies, both luminous and opaque, are formed for some great end, worthy his infinite wisdom. By means of the telescope new ones are daily discovered, which we could not perceive with our contracted sight, and therefore cannot be created solely for our benefit, as was formerly supposed.

The works of the Creator are so numerous and various, that it would be the height of human pride to suppose that all those spheres were only formed

for the comfort and advantage of our world, which is in itself so inconsiderable. Thirdly, the amazing, yet well regulated distance of these heavenly bodies, united with their exact and reciprocal effect, even at that distance, is another cause for wonder and admiration. If the universe had been formed by a fortuitous concourse of matter, even if it had not been planned by the wisest and most powerful of Beings, there would have been universal confusion and irregularity in the execution of it. But he who measures infinite space with the palm of his hand, fixed each globe in its appropriate situation. They never interrupt each other's progress, nor prevent the mutual effects of any: in short, the most perfect harmony is preserved throughout the whole.

If we only contemplate that assemblage which we denominate our system, there we shall perceive the globes of which it is composed beginning and concluding their destined course, at fixed and certain periods, without any variation.

O man, thou knowest it! it is God commands the sun to rise! each day he gives the varied seasons as they roll! and thou art never deceived in thy expectation of these vicissitudes of nature. Who but a God could be the author of so many wonders?

But, fourthly, the revolution of the earth, and the celestial bodies, simply considered as mere motion, demonstrates the existence and omnipotence of the Deity. In fact, as these vast bodies are continually in motion, it is evident there must be some great Agent, some first motive to actuate them: they possess not in themselves the principle of action, being by nature inanimate; they must

have obtained it then from some superior power. Besides, their revolutions are perpetual, regular, and periodical; which prove that they are directed by some divine hand, and not the effect of chance.

Lastly, light and heat are indispensibly necessary to the happiness of man, and prized in proportion as we are debarred from the enjoyment of them. If the world were buried in eternal night, it would become a melancholy prison to inhabit, and existence would be a curse instead of a blessing. Deprived of those animating beams, which bestow life and fertility on the productions of nature, our blood would be congealed with continual frost.

One sun has power to dispense warmth and animation over the whole earth. In the day it gives us light, illumes, and is then concealed beneath the obscure veil of night. In one season of the year it advances nearer to us, that the fruits of the earth which afford us nourishment may be produced and matured; and during another it recedes from us, to allow the earth a respite from its productive efforts. Were it nearer to us, we should be scorched with its burning rays; if it were placed farther from us, we should perish with the intense cold.

What compass has determined its exact and proper bounds? What source continually supplies this globe of fire, so that its size and heat are never diminished, but remain entire and unconsumed at the expiration of so many ages.

With what irresistible force does all nature proclaim the infinite wisdom and unlimited power of its Divine Creator!

Nov. 1.

Marine Animals.

At first it appears incredible that any animals should exist in the sea. It abounds with such various species of plants, herbs, trees, and vegetables, which are so entwined and entangled together, that the paths of the deep are apparently rendered impassable, and there is nothing but confusion and disorder in its extensive mazes. Yet, however improbable it may appear, nothing is more certain than that the ocean teems with animal life; and there is an universal connection between these creatures.

It is not a few individuals only which the sea contains, but such an infinite number of different species, that we are very ignorant of many of them, much less can we determine how many individuals belong to each species; yet there is no confusion in the midst of countless multitudes of animated beings, they are easily distinguished, and the most perfect harmony and regularity reign in the ocean, as in every other element.

All these creatures may be ranged in distinct classes; and possess their peculiar and distinct natures, food, mode of life, character, and instinct. There we perceive, as upon the land, regular gradations and shades, and we are led on by insensible degrees from one species to another. The one begins where the other terminates. The stone which is ranked the highest in the mineral kingdom, is partly a plant; the plant which concludes the vegetable kingdom, partakes of the nature of an animal;

and the animal which forms the link between man and the brute creation bears some resemblance to man. Thus it is with marine amnials: nature advances in regular gradations, from small to great; and every species insensibly rises to perfection. The whole is united by one immense chain. which is not deficient in one single link. The ocean teems with an incredible multitude of inhabitants. What variety is observed in their formation, instinctive powers, and destination! Some are so very small, that they are scarcely perceptible; others are so immensely large, that it makes us shudder to behold such enormous masses of animated matter. Some are entirely destitute of ornament, and their colour so much resembles the sea, that they can scarcely be distinguished from it; while others are adorned by nature with the most brilliant and beautiful variety of tints. Some of them multiply but very slowly, as they would destroy all others: while some, on the contrary, are remarkably prolific, in order to supply mankind and animals with food.

"O Lord, how manifold are thy works! in wisdom hast thou made them all!"

Nov. 2.

The Wisdom of God in the Connection between all the different Parts of Nature.

As all the united members of the human body form one perfect whole, which is planned and constructed with infinite wisdom, so also the productions of nature, with all their boundless varieties

are so many distinct parts, of which the Supreme Being has constructed one stupendous whole.

It requires but little scrutiny to convince us that every thing in nature is united together, and that there is an universal connection throughout the whole. It is evident that the earth is impregnated with several sorts of minerals peculiarly nutritious to vegetables. and these in turn support the animal kingdom. Fire, water, and air, are indispensibly necessary to the preservation of this terrestrial globe. This forms an undissoluble bond of union between all the parts of which our globe is formed; and naturalists have declared there is an absolute and necessary connection between our world, the sun, the planetary orbs, and the whole creation.

Could such an infinite number of various substances be combined and united together by less than boundless wisdom? Nothing less could link so many millions of different creatures, so that they are subservient to their reciprocal support and comfort. Let us only contemplate our globe, which forms so small a part of the creation, lest we should be lost in this immense ocean of wonders. Let us only at present reflect on that which is passing directly before our eyes; let us examine the brute creation, in respect to its connection with the rest of nature. If we survey the common wants of animals, how must our minds be filled with astonishment at the admirable union which is conspicuous throughout! The distribution of warmth and light, and the elements, are absolutely necessary for the preservation of order in nature; but a just proportion should be preserved, as either extreme would

be equally prejudicial, and change this beautiful creation into chaos.

One more degree of universal heat would be fatal to every living creature; for if our earth were universally more influenced by the sun's fervid rays, the summer's heat in every climate must be proportionably more intense. We are taught by experience, that in every country the heat is sometimes so excessive, that the increase, or longer continuance of it, would inevitably destroy both man and beast, and wither the grass and plants. If, on the contrary, the sun were more remote from our earth, the reverse would be equally pernicious.

Even now the cold is sometimes so severe, that animals are occasionally liable to be frozen, and perish beneath its cutting influence. Here we perceive the divine hand, which ordained that precise degree of warmth which is necessary to maintain the fruits of the earth, and is most conducive to the comfort of mankind and interior animals; any other would be pernicious, and even fatal.

The same exact proportion is observed in the atmosphere. The collection of vapours is principally owing to the density of the air, and the rain to its lightness. Now we should not be blessed with that variety of temperature, which is so indispensibly necessary for the production of vegetables, and consequently for the support of animals, if the air were not alternately condensed and rarefied. If it were commonly heavier than it is, it would be loaded with vapours, clouds, and fogs, and these would render it damp, oppressive, and prejudicial to plants and animals: whereas, if it were lighter, the vapours

could not rise, collect into clouds, fall in refreshing showers, which water and enrich the earth. Thus it is universally, nature always observes the same regular proportion: and as the distribution of the elements is most properly adapted for the preservation of animals, so they are in the most perfect unison with all other created things. The air is not only the source of that variety in the weather, which is so essential to the health and comfort of mankind, but is also the origin of sound: it has been exactly appropriated to the ear, which proves that admirable and infinite wisdom contrived it. If the air were more or less elastic, if it were more or less dense, they would suffer greatly by the change; man would no longer be able to modulate his voice to soft and pleasing tones, but it would resemble the hoarse thunder, or the hissing of a serpent. The air contributes also to the circulation of the blood, as its influence penetrates to the smallest veins. If the air were denser, every thing would be destroyed by its irresistible force; on the contrary, it would act too feebly if it were more rarefied.

Different beings have a thousand other connections with the air, yet it possesses all the properties which are required by each. If we survey the infinite diversity of plants and animals, none of which could exist without the benefit of air, warmth, and light; when we consider the difference between each species, their various constitutions, superior or inferior strength, and yet perceive that the elements equally agree with all, and supply their various necessities, shall we not be led to acknowledge that this admirable union and harmony between such a

variety of beings, must be contrived by that supreme wisdom to which nothing is impossible, or even difficult? In short, every thing in nature was formed by precise rules, and designed for certain ends. Not only the trees which rise majestically in the forest; the plants, so varied in their form and tints; the enamelled mead; the horse, so beneficial to mankind; the flocks, which supply us with food and clothing; the mines, which furnish us with wealth and ornaments; the ocean, which provides our table with exquisite fish, and bears us to distant regions; the celestial orbs, which shed their benign influence on our earth; but even the very moss, the shell-fish, and the insect tribes, contribute to the perfection of the whole!

Almighty Being! thou great Author and Preserver of all creation! without thy interposition all would be obscurity, confusion, and chaos, and this world would be destitute of connection, harmony, and happiness.

How can we contemplate these magnificent objects without the most profound reverence and admiration of thy wisdom!

Nov. 3.

Bed.

In the summer season we are not sufficiently sensible of the comfort of a bed; but now the cold grows daily more severe, we learn to prize this inestimable blessing. If we were destitute of this convenience during the cold nights of winter, our health

would be greatly injured by the obstruction of perspiration, and our slumbers would neither be so easy nor refreshing. In this respect it is a peculiar comfort to us; but let us discover the cause of that warmth we feel in it. We mistake if we suppose that we derive our warmth from the bed; on the contrary, we communicate our heat to that. It only confines and concentres the heat which evaporates from the body, and prevents its being dissipated in the air. But we should be still more thankful for this valuable blessing, if we allowed ourselves time to reflect on the number of creatures which are necessarily required in order to prepare it. If we compute a moderate sized bed to contain thirty-six pounds of feathers, and that one goose has but half a pound on its body, it requires the spoils of seventy-two geese for a single bed; and besides this, how many hands, how many other materials, are necessary to complete it.

It is by these calculations we learn to estimate the true value of the Creator's gifts. We too frequently survey the blessings of his beneficent hand with a superficial eye, but if we examine them more attentively, we should view them in a different light. Let us consider the various materials of which a bed is composed, and we shall be surprised to find that it requires the work of ten persons, and costs the lives of a greater number of animals. The fields provide the flax for our sheets, the flocks furnish us wool for blankets, and the forests supply the wood. We may make the same reflections on our most ordinary daily mercies. Our clothing, food, and drink, in short, every necessary for our

subsistence, is obtained by the united industry of many individuals. How must our hearts overflow with gratitude when we sink to repose on our downy bed! A thousand daily mercies should induce us to offer up our thanksgivings to the Almighty; but this motive alone should be sufficient. When fatigued by the labours of the day, what a respite and relief we find in sweet repose! During these severe nights no warmth is comparable to that of a bed, not even a large fire; it provides us with warmth and repose at little expense.

Let us remember then, when we lie down in our beds, to bless that beneficent Power which bestowed this truly valuable blessing upon us. But there is another consideration which should increase our gratitude, when we consider that too many of our unhappy fellow-creatures are deprived of beds to lie on, or seek repose upon them in vain. Do they not deserve our commiseration? How many unhappy wretches are exposed without a shelter to all the inclemency of the weather, travelling by sea or land! How many are confined in dungeons, or in poor huts sighing for repose, and destitute of this inestimable blessing! It is most probable that the hundredth part of the inhabitants of every town are reduced to some one of these deplorable situations. How felicitous does our situation appear in comparison with theirs. How many of our fellow-creatures are deprived of sleep for our protection; the soldier watching upon duty, and the sailor on the stormy ocean! But a far greater proportion can have no repose, though they recline on a bed of down. Within a very limited circle, how many are

deprived of the balmy sleep by pain or sickness, others by the pangs of affliction, sinners by the bitter remorse of a guilty conscience, many an unhappy wretch by secret trouble, poverty, and anxiety for the morrow!

What is our duty as Christians with respect to them? If we are unable to bestow pecuniary aid, at least, let us grant them our pity and our prayers. When we repose on our beds, let us implore the Almighty in behalf of those who are deprived of this invaluable blessing, or who cannot enjoy it. Let us pray for those who are robbed of repose by sorrow, poverty, or pain. Let us always remember the bed of sickness and of death, which must ere long be our own. Our repose will not always continue so peaceful and profound: the nights will come when we shall bathe our couch with tears, when the agonies of death will rend our souls; but these are the harbingers of eternal repose and uninterrupted felicity. We shall rest in the silent tomb, and arise with new vigour to behold the face of the Almighty. Let not prosperity and health banish from our minds the thoughts of approaching dissolution, but rather let this thought be a constant source of consolation and delight to the soul that is prepared for this final scene of mortality.

Nov. 4.

Reflections on the Summer which has just passed.

The serene and beautiful days of summer, when not a cloud obscured the azure sky and every object

wore the smiling badge of peaceful joy, are vanished, and have left behind them but the sweet remembrance of their faded charms, and the mournful emblems of universal frailty and approaching decay. How is the face of nature changed through all her works! The feeble rays of the sun obliquely beam through lowering clouds, and shed their diminished influences on gardens stripped of all their gay parade; on fields, where now the traces of the late joyous harvests are scarcely visible; and hills, which now retain no vestige of the verdant turf with which they were so lately clothed. The air no more resounds with the soft warblings of the feathered choristers chanting in sweetest strains their wild and varied harmony; the dull monotony which reigns is only interrupted by the hoarse croaking of the raven, and the loud piercing screams of the numerous birds of passage, bidding the gloomy season, so uncongenial to their natures, a clamorous farewell before they fly in search of milder and more favouring climes. The aspect of the neighbouring hills is barren, no longer overspread with milk-white flocks, nor enlivened with their perpetual bleatings.

How changed is the surface of the country! once so cheerful, yielding a willing bounteous harvest to the hand of smiling Plenty, bending to receive it. The beautiful verdure, which was its fairest ornament, has lost its living honours, faded to the sickly yellow hues of autumn. The blackening clouds are ready to descend in chilling torrents, and a thick veil of gloomy vapours obscures the soft serenity of morning. Such are the prospects which nature now presents!

Who can behold the altered scene, and forbear a mournful reflection on the instability of all terrestrial things? Those cheerful days are flown; and whilst we are preparing to enjoy them, the fleeting pleasures vanish from our expecting souls! But ought we to murmur at the dispensation of Almighty wisdom? Ah, no! rather should we remember all the blooming hours of summer, all the simple and innocent delights attendant on their train, and praise the kind dispensing Power that gave the liberal blessing. What sweet sensations they create! with what pure and elevated raptures does the soul contemplate the ever-varying charms of nature, when the verdure of the humble valley and the lofty mountain spring luxuriant as we gaze upon their blooming beauties, when the morning lark swells his wild notes as he ascends the skies, and the nightingale tunes her pensive melody beneath the shelter of the shadowing grove, when the flowers spread balmy fragrance on the air we breathe, when the morning dawn sheds renewing vigour and universal gladness, or when beams of the setting-sun tinge the forest and the mountain with their glowing crimson, with what pure unmingled happiness does the contemplation of nature, dressed in all her full luxuriance, inspire our grateful souls! What valuable gifts do the gardens, the fields, and the orchards bestow on their possessors, independent of the charms they offer to the sense and imagination! Can we reflect on the months that are gone without a sweet emotion of gratitude, without offering the incense of our praise to the great Parent of nature, who thus crowns the years with his mercies. Our various

wants are now supplied by the plentiful productions of summer and autumn. We have witnessed the liberal activity of nature during the continuance of these cheerful seasons, in fulfilling the Creator's beneficent designs in favour of man. How many vigorous plants and blooming flowers have the mild sun-beams and the soft-stealing breath of spring reared to perfection.

How rich a store of plentiful provision has been matured by the more scorching rays of the sun, and safely secured from the destructive ravages of winter by the cheerful toils of autumn. The parent earth has now fulfilled her annual labours, and seeks a temporary repose. Thus has nature for many months continued her efforts with unremitting exertion, and even now she is not idle, but silently prepares the wonders of renovated creation.

Let us seriously ask ourselves if we have been equally industrious. Have we so devoted our time as to be enabled thus to produce the important fruits of constant occupation? The farmer counts with joy his swelling sheaves; can we in like manner enumerate our growing virtues, and our various good works? Have the pleasures of summer improved our hearts, or increased our gratitude? Have our souls expanded with devotion as we looked from nature up to nature's God? How have we employed the lengthened days of summer? Have they been spent in acts of virtue and benevolence? Whilst viewing the glorious sun, the gay parterre, and each delightful object of the smiling season, have our bosoms glowed with those superior sentiments which the magnificence of the scene ought

naturally to inspire? Can we soberly declare as the result of such reflections, that the present summer has not been suffered to elapse in useless indolence, like too many we have already passed? Let us be grateful for the continuance of our existence here; but let us remember also, that it may be the last summer we are to spend on earth. And knowing ourselves to be rational and accountable beings, let us from the present moment carefully and constantly redeem the time we have already squandered in useless or vicious pursuits.

Nov. 5.

Inconvenience of Night.

At this season every night grows sensibly longer, and in some respects unpleasant; for though night is designed to invigorate the animal frame, yet this necessary refreshment is a plain indication of the frailty and decay of our nature. The labours of the day are suspended during the hours of repose, not only on account of the darkness, but that man may enjoy some respite from his toils, and recruit his exhausted strength and spirits.

When we are restless and deprived of sleep, the silent hours of night seem slow and tedious; with what impatience does the sick man count the hours and wait for the dawn of day. But during night we are liable to many other incidental disasters: to mistake our way, or stumble against impediments which we are unable to perceive: how many travellers wander from the beaten track into rugged paths.

amidst thorns and briars, into bogs and marshes, or falling from dreadful precipices are dashed to pieces. During the hours of darkness we are exposed to the assaults of robbers, who snatch this favourable moment for the perpetration of their infernal deeds; for the obscurity of night encourages the gratification of every criminal passion.

Another inconvenience arises from the coldness of night; for when the sun has sunk beneath the horizon, it deprives one hemisphere of its animating beams, which dispense warmth and light to the world. Night is also a striking emblem of death, and continually reminds us of it. Day and night are alternate, and neither of them remain for a continuance; and though the hours of darkness are protracted to greater length in winter, and though the summer days are regularly divided by the gloomy veil of evening, yet it is certain, excluding the rays of the moon, the twinkling stars, and the twilight, and there is a larger proportion of light than darkness on the earth.

Blessed be that Almighty power who commanded the moon to shed her mild radiance, and the glittering stars to illume the darkened world when wrapt in midnight silence; who bids the fervid beams of the meridian sun shine in their noon-tide splendour! But above all, blessed be his holy name who shed the sacred influence of the gospel in the midst of error, ignorance, and misery! In the obscurest night, when involved in grief and adversity, let this sweet remembrance cheer our drooping minds, that we are approaching the regions of eternal light, tranquillity, and joy. If sleep forsakes our eyelids

during the hours of darkness, if sorrow, or if sickness, compel us to count the weary hours, let this sweet reflection console our minds, that we are not condemned to eternal night, but have the delightful anticipation of a heavenly kingdom, that we are advancing towards that blessed land where the purest light for ever reigns, and neither sorrow nor sickness shall intervene!

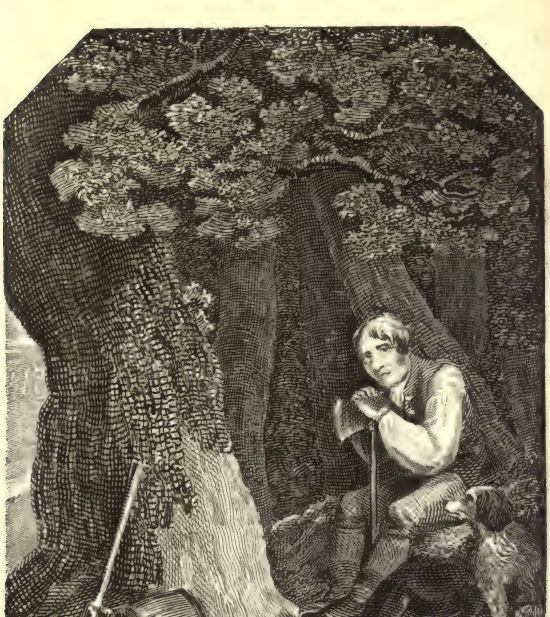
Nov. 6.

Reflections on Woods and Forests.

The forests present us with the most striking picture which adorns the face of nature; for to a sensible mind, which perceives a beauty in every thing which is beneficial to man, a thousand objects will arise worthy attention and regard. A solitary wood invites us to reflect on the grandeur and beauty of nature: the pleasing shade and the solemn silence collect our wandering thoughts and rouse the imagination.

The number and variety of trees are the first objects which attract our attention: they are less distinguished by their various heights than by their different stems, formation, and leaves; the resinous pine is not remarkable for the beauty of its leaves, but they preserve their verdure during the rigorous winter. The linden-tree, the ash, and the beech, excel in their beautiful and varied foliage; their vivid green relieves and charms the sight. The broad indented leaves of these trees form a striking contrast to the narrow fibrous leaves of others.

NOVEMBER.



A solitary wood invites us to reflect on the grandeur and beauty of nature.

Nov. 6th

For what numerous purposes is wood employed! The slow-growing oak, the leaves of which remain later than those of any other tree, affords a hard and durable wood, which art has taught man to carve and convert into the most useful forms. Lighter wood is employed for different purposes, and being plentiful and quicker in its growth, is more universally used. It is to the forest we are indebted for our habitations. It supplies us with a great part of our fuel, which is necessary to dress our food and keep us warm during the severity of winter. Industry and perseverance have taught man to work it into a multitude of elegant forms. Divine wisdom has ordained that woods and forests should be dispersed in a more or less abundance throughout the world: in some countries they are at a considerable distance from each other, and in others they are so extensive as to occupy several leagues of ground; so that neither the immense quantity continually consumed for the service of mankind, the ravages of accidental fires nor severe winters, have at present exhausted them. In the short space of twenty years a forest will rise from a humble copse, or a few scattered trees.

Is not the power and beneficence of the Deity conspicuous through all his works? How supreme his wisdom! Grant, O heavenly Father, that we may be properly sensible of thy beneficence and pay thee thy just tribute of gratitude, love, and adoration.

The growth of forests is not entrusted to the care of man. Other things are obtained by culture and industry: the ground must be tilled, and seeds

deposited in the earth, and the farmer must employ much labour and perseverance; but the trees of the forest are reserved for God's own care.

Almighty Being! it is thou alone, who, during the lapse of ages past, fixed and maintained them unshaken by the violence of the northern blast! thou waterest them with fruitful dews and genial showers, which enable them to renew their annual verdure, and preserve a kind of immortality!

Oh, man! thou art overwhelmed with blessings! lift up thine eye towards that Being who delights to do thee good! The forest proclaims his beneficence, and thou art guilty of the basest ingratitude if thou art insensible to those gifts of which they are continually reminding thee!

Nov. 7.

The Sense of Feeling.

It is a very just assertion, that the touch is the universal sense of animals; it is the basis of all other sensations, and there can be neither sight, hearing, smell, or taste, without contact.

But as the touch operates differently in the sight from what it does in the hearing, and in the hearing differently from the other organs of sensation, we may in this respect distinguish the sense of feeling from that universal sensation which was previously mentioned. They are both produced through the medium of the nerves: they are a sort of fine strings of extremely delicate threads, which ori-

ginate from the brain, and are ramified through every part of the frame, even to the very extremities of the body. Wherever there are nerves, they excite sensation; and whatever part is the seat of any sense contains some of these nerves, which are the general organs of feeling. There are optic nerves, auditory nerves, olfactory nerves, and nerves which are affected by the touch; and these, like the sense of feeling, are dispersed through the whole body. They proceed from the spinal marrow, are conveyed through the side orifices of the back-bone, and thus communicate with every part. These nerves abound also in those parts which serve as organs to the various senses; because, independent of their own appropriate sensation, they must also be susceptible of feeling. It is on this account that the eyes, ears, nose, and mouth, receive impressions which result entirely from the touch, and are not produced by their own particular nerves. That the sense of feeling is excited by the interposition of the nerves is an indisputable fact, for every member is more or less susceptible in proportion to the number of its nerves; and feeling entirely ceases where there are no nerves, or when the nerves have been separated and destroyed. Incision may be made in the fat, the hair and nails are always cut, and even the bones may be severed in peices, without exciting any pain. The bone is enveloped by a nervous membrane; the nails are fastened in a part which is interwoven with nerves, and it is only when these are injured that we feel pain. Here let us pause, to admire and adore the unbounded wisdom and goodness of the Almighty. How evidently

was that plan ordained for our benefit, which directed that the sense of feeling should be dispersed through the whole body. The other senses are situated in those parts best adapted for their preservation, and the most advantageous use of them. It was necessary for the protection and security of the body, that all the parts of which it is composed should be warned of whatever might prove beneficial or injurious, agreeable or disagreeable; and the sense of feeling was kindly diffused over the whole frame to answer this important purpose. It is another proof of the admirable and universal provision which divine wisdom has made, that many species of animals have a much more delicate sense of feeling than mankind: this is necessary for their different habits and modes of living, and compensates them for the deprivation of some other senses How exquisite must be the sense of feeling in a spider, when even in the centre of the web with which it so curiously surrounds itself, it perceives the smallest agitation of its air-built castle, which the approach of other insects may occasion! But it is needless to dwell on the powers of feeling amongst these inferior orders of animal creation, if we reflect at all on the operations of this sense upon the human species, it must be sufficient to excite our admiration and our praise. How can the nerves, which appear to us to be capable only of different degrees of length or thickness, to be susceptible only of more or less tension or vibration, transmit to the soul so many varied ideas? Can there be so intimate a correspondence between our corporeal and intellectual powers, that nerves of a

particular construction should excite certain emotions in the soul? Our knowledge is too limited to decide this question, and we must with humility number it among those mysteries of nature which we are not at present permitted to penetrate. Let us offer up the tribute of our gratitude to God, that amongst the truly valuable senses with which his gracious wisdom has endowed us, he has bestowed on us the sense of feeling. From how many enjoyments should we be debarred, if we possessed less sensibility! Would to heaven that our souls cherished as lively a sense of what is truly great and good as our bodies are susceptible of pleasing sensations! This moral sense was once impressed upon our souls; though, alas! its influence is much diminished! Grant, O, Lord! that it may never be entirely effaced from the tablet of our hearts!

Nov. 8.

A Remembrance of the Blessings the Spring and Summer afford us.

In one united strain let Friendship raise
The theme of homage to its Maker's praise;
Let us retrace those scenes of dear delight,
Where gloomy sorrow vanish'd from our sight;
While blooming Nature, with her varied charms,
Clasp'd us, enraptured in her rosy arms!
Devotion led us to the fragrant bowers,
Thro' gentle mazes strew'd with new-sprung flowers;
When hand in hand we sought thro' hills and glades,
That God whose power all Nature's work pervades.

We heard the warblings of the feathered throng,
Which 'mongst the foliage tun'd their evening song;
Where Friendship, Harmony, and Pleasure meet,
To render happiness supremely sweet.
While smiling Nature's lavish hand bestows
The balmy odours of the fragrant rose;
The pink and gillflower the air perfum'd,
And scented flowers on earth's fair surface bloom'd.
Then did our souls with grateful joy expand,
And bless the goodness of God's bounteous hand!
Where cool refreshing zephyrs gently play,
Tempering the fervour of the noon-tide ray;
The feather'd songsters, with fresh life renew'd,
Seek the cool covert of a silent wood,
There, undisturb'd we felt the calm repose
Which Wisdom, join'd with Piety, bestows;
There we reclin'd beneath the verdant trees,
Which gently whisper'd to the evening breeze;
Nature rich sources of content bestow'd,
And our full hearts with gratitude o'erflow'd.

What wisdom shines in every murmuring rill,
Air, beasts, and insects, vale, and lofty hill!
What cheerful prospects strike the ravish'd view,
Like those fair scenes our first blest parents knew
Of flowers and meads, enamelled by the hand
Of liberal Nature, and by zephyrs fann'd!
Yet unmatur'd the produce of the year,
From the green blade burst forth the loaded ear;
The lavish treasures of the bounteous field,
And the rich milk the lowing cattle yield:
The lofty woods their ancient honours rear,
And various tints the solemn verdure cheer.
The setting sun now gilds the mountain's brow,
And golden harvests undulate below!

Sure all these varied objects must impart
The softest feelings to the grateful heart,

And bid the soul in one harmonious lay,
The noblest homage to its Author pay,
Whose glorious image Nature's works display!
Unthinking man! who can unmov'd behold
The various charms of Nature's works unfold;
The lofty firmament, so fair, so grand,
Which the Almighty Architect has plann'd,
And yet indifferent to these beauties still,
Despise their Author, and dispute his will.
For thee soft Zephyr, on his airy wings,
Ambrosial sweets and fragrant spices brings;
For thee the silver stream meandering flows,
Whose verdant banks invite thee to repose,
When the meridian sun his beams bestows;
For thee the corn waves softly to the breeze,
And luscious fruit bears down the loaded trees!
Yet man, unmindful of the charms they bear,
Scarce deems them worth his notice or his care.

O God! the man upon whose tender breast
True love of thee is faithfully impress'd,
Will trace the wisdom of Almighty power
In ev'ry zephyr, rivulet, and flower;
A blade of grass, an ear of corn, will prove
The faithful heralds of thy bounteous love.

With equal ease, by God's creative hand,
Is form'd an angel, or a grain of sand!
The mite and elephant from Him derive
Existence, and the means by which they live;
The blade of grass and aloe-tree proclaim,
With equal eloquence, his mighty name!
The thinking mind his pow'r almighty hails,
Alike in muscles and stupendous whales;
The gentle zephyrs whisper forth his praise,
While the rude storm his awful power displays;
The crystal drop, or ocean's wide expanse,
The spangled sky, or meteor's fleeting glance,

With equal lustre crown his lofty name,
With equal voice his forming hand proclaim,
Display the honours of his awful nod,
Or speak the milder praise of Nature's God.

Nov. 9.

Foreign Animals.

EVERY quarter of the globe has its peculiar animals, and the Creator has ordained that they should each be placed in that situation for which they are particularly adapted by their separate properties. The elephant and camel are the most remarkable animals in the southern climate, in size they are superior to all other quadrupeds; the elephant, especially, appears like a moving mountain, and his limbs like strong pillars: his head is joined to a very short neck, but is armed with too formidable tusks, sufficiently strong to tear up trees by the roots. A longer neck could not support his unwieldy head, and it is in some measure compensated by the great length of his trunk, which he employs as a hand to convey food to his mouth, to avoid the trouble of stooping for it; it is so pliable, that he bends, moves, and turns it with the same facility as we do our fingers, but it also serves as an organ of smell; and this animal may be said with great propriety to hold his nose in his hand. His eyes are small in proportion to the rest of his body, but they are lively and lively, and express all his internal feelings

While the lephant is in a state of independence, untamed by the art of man, he is neither sanguinary nor ferocious, pacific and gentle in his nature, he never employs his weapon but in his own defence. He never assaults when unprovoked; but when irritated, is furious and revengeful in his resentment: he seizes his enemy with his trunk, flings it against him like a stone, and then crushes and tramples him to death. It is, however, often attacked and conquered by the rhinoceros, an animal which extremely resembles the wild-boar; it pierces the belly of the elephant with the horns which grow upon his nose. With little consideration we shall perceive the wisdom of the Deity in the formation and creation of the elephant. He has ordained it a native of those countries which abound in grass; and to prevent its multiplying too fast, and becoming a burden to the earth, the term of female gestation is exactly two years, and it does not couple with the male till three years after.

The camel is one of the most useful animals in the east: it is particularly calculated to endure the greatest hardships and fatigues amidst the barren wastes and burning sands; being endowed with the power of remaining four or five days without drink, and requiring a scanty allowance of food in proportion to its size. It is contented with the few shrubs and plants which the desert produces, and when unable to procure these, two measures of beans and barley are sufficient for a whole day's subsistence. Besides the humps which rise on its back, it is remarkable for another singularity in its formation: it has a double throat; one division ex-

tends to the stomach, and the other terminates in a bag, which serves as a reservoir for water: it remains there without corrupting: and when the animal is pressed by thirst, or wishes to dilute its husky food, it draws up part of this water into the belly, which having moistened its parched throat, afterwards descends into the stomach. Seven or eight hundred pounds weight is computed to be the common burden of a camel, which they will carry two German leagues in half an hour; they generally travel twelve or fifteen hours in the day. The fleshy foot of the camel is best adapted to tread on burning sands, while the horny hoof of the horse would be scorched or injured by it.

The elk, the sable, and the rein-deer, are the most remarkable quadrupeds of the northern countries. The elk is large, vigorous, and has a beautiful shape. Its head, in form, size, and colour, is a little like the mule. Its legs are long and powerful, its hair is of a light grey. This animal is simple, wild, and timorous; it will feed on any thing, but gives the preference to the bark or tender shoot of the willow, or the birch. It is remarkably swift, and having very long legs can run a great distance in a very short time.

The sable wanders in the deserts of Siberia, and is valued on account of its beautiful fur. Those unhappy wretches who are exiled to these barren deserts are generally employed in the chase of this animal.

The rein-deer exceedingly resembles the stag, and has a very elegant and pleasing form: his food consists of moss, grass, leaves, and buds, or shoots of

trees. They are very beneficial to the northern nations. Their flesh provides them with food, and their milk with drink; and they draw the natives in their sledges with extreme rapidity upon the ice and snow. The rein deer constitutes the chief wealth of the Laplanders. The skin provides them with clothes, beds, and tents; in short, this animal furnishes them with all the necessaries of life.

The remarks we have been making on these foreign animals may give rise to the most serious reflections in the human mind. How amazing the contrast between the elephant and the mite! what a surprising variety is observable in their exterior forms, their organs, instincts, motions, and manner of propagation! yet every individual in the animal kingdom is perfectly adapted to its appropriate end and situation. The animals which inhabit the other quarters of the globe could not survive the difference of the climate, air, food, and temperature of Europe, and doubtless there are millions of animals which could no more exist on our globe than we could inhabit the planets of Saturn or Mercury.

Nov. 10.

Variety of Winds.

There is a great variety of winds. In some places they continue during the whole year, and always blow from the same quarter; in others they are periodical, but still continue to be governed by regular and determined laws. In the open sea, be-

tween the tropics, and some degrees below them, a constant wind is observed, without any considerable variation On the north of the line it blows towards the north-east; on the south, towards the south-east: but this is more or less according to the position of the sun. But if it be opposed by continents or islands, the direction may be changed to north-east. There is generally a westerly wind in the southern parts of the ocean. Its proximity to the shore renders it more variable, and it is particularly so on the land. The continual east wind is principally occasioned by the heat of the sun affecting our atmosphere. In the Indian seas are periodical winds, called monsoons, which blow six months in one direction, and six months in the contrary. The cause of these winds have not yet been discovered, but they are attributed to changes from heat to cold, the situation of the sun, the nature of the soil, burning meteors, vapours dissolving into rain, and similar circumstances. Some seas and countries have their peculiar winds and calms, as Egypt and the Persian Gulf, which are annually annoyed during summer with a burning wind, which suffocates and scorches every thing before it. The Cape of Good Hope is remarkable for a cloud, which is stiled the fatal wind, or ox-eye; at first it appears very inconsiderable, but rapidly increases till it occasions a violent tempest, which ingulphs large vessels in the deep. Variable winds are observed through the principal parts of the globe, and have no regular direction or duration. It is true that some winds may be more frequent in one place than in another, but they neither begin nor end at

any certain period : they vary in proportion to the several causes which interrupt the equipoise of the air. Heat, cold, rain, fine weather, mountains, and even straits, capes, and promontories, may cause an obstruction in their course, or alter their direction. The different modifications and changes of the wind are certainly produced by many latent causes. But one remarkable circumstance occurs every day and in almost every situation : a little before sun-rise, when the air is perfectly serene, a quick easterly breeze arises, which continues to blow some time after its appearance. This is accounted for in the following manner : the atmosphere being heated by the rising sun is consequently rarified, and by dilating drives the contiguous air towards the west, and necessarily occasions an easterly wind, which subsides when the air becomes sensibly warmer. For this reason, in the torrid zone, this easterly breeze must not only precede the sun, but be considerably stronger in proportion as the sun's influence is greater under the line than in our more temperate climate. In the torrid zone the wind generally blows from east to west.

It is evident the winds are not the effect of chance, but that these and every thing else must be ascribed to a first great cause. The wisdom and beneficence of the Creator are conspicuous in these and all his other works! He ordained that there should seldom be absolute calm ; and he fixes the motion, strength, duration, and direction of the winds! Even their changes are beneficial to us. When animals and plants languish and fade with a long-continued drought, a sea-wind bears clouds and

vapours, which falling in refreshing showers, water the earth, and re-animate all drooping nature. A dry easterly wind succeeds, which restores the serenity of the atmosphere. The north wind delivers it from the many icy particles, and carries off the noxious autumnal vapours: this is followed by a southerly wind, which pervades the air with its enlivening warmth.

We owe our health and the fertility of the soil to these perpetual variations of the wind: and who can reflect on these sublime subjects without the profoundest admiration of that Almighty Power who commands the elements and they obey? At his word the tempestuous billows rise, and rush from shore to shore; and when he bids they are hushed to silence! Should we not confide in this Almighty Being? Will not the great Arbiter of the winds deign to direct our concerns? Whilst he ordains their various changes, so that they conduce to the comfort of his creatures, may we not believe that the perpetual vicissitudes of this life will ultimately contribute to the felicity of every individual?

Nov. 11.

Hunting.

The chase, at this season, is the favourite amusement of the higher classes; but it would be a happy thing if this recreation were not so universally admired, for man is often tempted to exercise cruelty over those animals which are subjected to his government, and abuse the power he possesses over them.

The pursuit of the hare and stag must make every feeling bosom shudder with horror. Can that pleasure be innocent, which consists in pursuing a harmless animal with rage, till exhausted with anguish, terror, and fatigue, it expires in horrid convulsions? Can humanity behold this scene without resentment and commiseration?

The man who is fond of this amusement, must insensibly lose the softer sensations of humanity. He becomes inured to scenes of horror and destruction; and being accustomed to cruelty towards the brute creation, he no longer retains that universal philanthrophy to his fellow-creatures. And surely the employment of the chase is incompatible with those duties we are required to fulfil, without including the loss of time, which is certainly of great consequence; it also fills the mind with that levity which is unsuitable to more serious and important occupations. These tumultuous pleasures entirely banish reflection, while the gentler amusements only relax and divert the mind in a proper degree. It is a very dangerous amusement, in a moral and religious view; for ought we not to guard every inlet to vice and irregularity?

What cruelties are exercised towards horses, dogs, and even men! what mischief is done to corn and pastures! Are these too trifling to deserve our notice? If we were wise we should discover and pursue more pure and solid gratifications; if we look around us we shall perceive much more instructive objects. This spacious universe, the study of the arts and sciences, the joys we taste through the medium of the senses and the society of friends, in

short, a thousand things will yield the sweetest enjoyments. Why then should we seek those gross and boisterous pleasures which leave remorse behind them? The culture of our moral and intellectual faculties will every moment produce the purest satisfaction. It is in this that the wisdom of a Christian philosopher consists. He possesses the art of being happy with little trouble, and without the sacrifice of virtue.

Nov. 12.

Dreams.

Our souls are not totally inactive during the hours of repose, or wholly absorbed by the lethargic influence of sleep. Our ideas and imagination are still employed, which is proved by dreams. However the intellectual powers have little share in them, except, indeed, the memory, and they relate less to the rational than the animal soul.

If we consider our dreams, and examine why they are in general so unconnected, or represent such singular events, we shall perceive that it is chiefly owing to our being more affected by sensations than perceptions. They represent persons unknown or deceased, but they appear alive, and we associate with them things which are actually existing. If the soul acted in dreams as it does when we are awake, these unconnected ideas would soon be rectified, but it has only the power of receiving and following the images which are presented to it.

Though these are forcibly impressed upon the mind, they are incoherent, and strangely associated. The sensations succeed one another, but the soul neither regulates nor combines them ; we have only sensations then, and not conception, for the latter only exists when the soul compares the sensations, and operates upon the ideas which are conveyed to it by the senses. Thus dreams are formed in the lower region of the soul, and by its inferior faculties. They are not produced by its actuating force, and only belong to the animal memory. It is singular that we seldom dream of hearing any sound, but only fancy we behold objects; but it is still more extraordinary that the images always resemble the original, and are naturally represented. None but the painter's pencil could trace such exact and faithful landscapes, yet they are depicted in dreams by those unacquainted with the art. As to the accidental causes of dreams, by which previous sensations are renewed without the aid of actual present impressions, we may observe that we never dream in a profound sleep, because every sensation is extinguished, every organ is inaccessible, the internal and external senses are inactive. The internal sense is the first to sleep and to awake, being more quick and lively, and perhaps more easily impressed than the exterior senses. Sleep is then broken and unsound, and this is the time for dreaming; former sensations are renewed, especially those on which we have more reflected. The internal senses, which by the langour of the exterior ones cannot receive present impressions are employed with, and operate upon preceding sensations, especially those which

have particularly affected us; and for this reason dreams are generally very pleasing or very distressing. But one remarkable circumstance in dreams is, that they shew the character of a man: from the phantoms which fill his imagination we may judge whether he be virtuous or vicious.

The philanthrophist and laborious man preserve their separate dispositions during the hours of sleep, but this is not a certain rule, for impure and wicked ideas in a dream may be occasioned by the state of the body, or by incidental circumstances. But our habitual conduct will prove to us whether these dreams ought to be imputed to us, and we should also attend to the judgment we then form of them. A good man is indifferent respecting them; he is grieved if in fancy only he deviates from the rules of virtue, for those who are impressed with a sense of God's grace seldom fail of heavenly ideas in their dreams, if we may be allowed the expression. But it is not only in the hours of sleep that fantastic images arise in the mind: how many dream awake, some form elevated ideas, because they have been raised by fortune or favour of princes: others build their happiness on the visionary hope of immortal fame. Intoxicated with passion and fleeting joy, they fancy felicity which deceives their hopes, and vanishes like a morning dream. The prophet has aptly described this character:—"They resemble a "hungry man who dreameth, and behold he eateth; "but he awaketh, and his soul is empty: or, as a "thirsty man dreameth, and behold he drinketh; "but he awaketh, and behold he is faint, and his "soul hath appetite."

Let us not search for happiness in empty phantoms and idle chimeras of the brain. Let wisdom direct our souls in the pursuit of true and permanent felicity.

Nov. 13.

Every thing throughout the Universe is connected together, and combines for the preservation of the Creatures which inhabit it.

Every thing in nature is constructed in such an admirable manner, that they each conduce to the preservation of the other. The earth, its rocks, minerals, and fossils derive their origin and continuance from the elements. The vegetable kingdom subsists upon the juices of the earth, and animals are supported by feeding upon them. The earth nourishes the plants, the plants provide food for the insect, the insect for the bird, the bird for beasts of prey; in their turn the wild beasts are devoured by the vultures, the vulture becomes at length a prey to the insect, the insect to the plant, and the plant to the earth. Even man, who is lord of the creation, himself becomes a prey. Such is the regular gradation through all the works of nature. Thus every being was created for the benefit of another.

Some animals provide us with fur to cover us. Dogs pursue the stag, and have to furnish our table, and are rewarded with little share in the prey. The terrier drives the rabbit from its burrow into our snares; the horse, the elephant, and camel, are

trained to carry burdens; and the ox to draw the plough; the cow provides us with wholesome milk, the sheep with warm wool; the rein-deer draws the sledges over the ice and snow. The sow and porcupine rake into the earth, and the moles loosen and stir it up, that it may more easily receive the seeds of plants which are dispersed by the wind. The hawk serves for fowling, and the hen gives us eggs; the cock wakes us in the morn, while the soaring lark warbles his soft notes to the rising sun; the blackbird charms us with his constant note, and the pensive nightingale warbles her nocturnal song, and delights the ear; while the gay plumage of the peacock charms the sight.

The fish are taught by instinct to leave the depths of the ocean, and venture upon the coast and up to the rivers, to serve as food for men, birds, and beasts. The silk-worm spins his precious web to clothe us. Bees collect honey. The sea shore abounds with craw-fish, lobsters, oysters, and every species of shell-fish.

The jack-a-lanthern, or great fly of Surinam, gives light to the inhabitants of these countries during the hours of darkness with its luminous body.

We shall perceive the same destined end, if we observe the various occupations of mankind. The sailor braves the stormy ocean to export to distant countries the merchandise which is another's property; the soldier sacrifices his life to his country; the lawyer is employed for the benefit of his fellow-creatures; sovereigns and magistrates are placed at the helm of government, and devote their time and talents for the public weal. Parents treasure up

wealth for their posterity, and the ploughman sows and gathers in the grain, of which he has a very small share. Thus the wise Creator has ordained that all beings should be reciprocally useful. Let us learn from hence our duty to our neighbour; the strong should help the weak, the learned assist and instruct the ignorant; in short we should love them as ourselves, and fulfil the designs of our Creator. Man's mutual dependance has induced him to form societies, and thus to accomplish by united strength, what could not have been performed by divided force. No one could erect a magnificent building without assistance, but this is easily done when different workmen unite their industry. Such is the constant law of nature, no art or science, and no beautiful piece of workmanship can be accomplished without the concurrence of several persons.

How many millions of individuals are requisite, to render a monarch powerful, an empire happy, and a nation flourishing! How conspicuous does the Creator's wisdom appear in this! To render all his creatures happy, especially mankind, he has contrived such an admirable union, that they are all in a state of mutual dependance. Experience daily convinces us that he planned every thing in nature to conduce to our comfort; even the minutest parts, which scarcely appear worthy our notice, contribute to our felicity; even the insect tribes are beneficial to us. Millions of hands are continually labouring for us! How many animals lose their existence in the support of ours! And in many other latent ways nature is active in our favour. May this teach us to set a just value on the beneficence of

our Heavenly Father, and to be sensible of our happy situation.

Nov. 14.

Common Salt.

This seasoning is universally in use, and cannot be dispensed with. Its flavour and properties of digestion are admirable, and it may be esteemed one of the most valuable gifts in nature. The inhabitants of the sea-shore dig marshes, which are called salt-marshes, and cover them with clay; the rough sea flows into them, and when the sun has evaporated the water, great quantities of salt remain at the bottom. Nature also abounds with salt-springs, fountains, and lakes. They boil the water in cauldrons to extract the salt. It is sometimes found in solid masses in the mountains. The most famous mines are those of Catalonia and Poland. These salts are alike as to their principal properties. We learn by experience that salt dissolves in the stomach, assists digestion, prevents putrefaction and too great fermentation of our food: it is taken to prevent crudities in the stomach, and want of appetite. It not only dissolves the phlegm, but slightly irritates the nerves of the stomach, proves a good stimulus, and promotes its operations. Other salts are too disagreeable for the taste, but this is not only a good digestive, but very palatable.

We do not properly estimate this invaluable blessing, though we constantly enjoy it. We should be much more grateful for the gifts of heaven if we

reflected on them. Great part of our food would be insipid without salt; but it is much more valuable as the greater preservative of health. Another circumstance renders it interesting to an observer of nature: the smallest grain of common salt is cut into eight angles, or with six sides, like a dice, therefore most of the large masses of this species must have a cubical form.

In this grain the divine hand is conspicuous, who has given it an invariable shape. This exact form is a convincing proof that it received it from an intelligent Being, and not from blind chance. This thought is so important, that we should seize every opportunity to impress it on our souls.

Nov 15.

Origin of Fountains and Springs.

It is an indisputable fact, that rivers are formed by the union of less ones, and those by the rivulets which flow from springs and fountains. But from whence do these springs derive their origin? Water always fills the lowest parts of the earth, from its fluidity: but whence does that proceed which flows continually from more elevated spots? A great deal is produced by the snow, rain, and the detached particles of vapours which fall from the air, consequently rivers and springs are very rare in the deserts of Arabia or Africa, where it never rains. They penetrate the earth till their progress is obstructed by beds of white clay, where they increase

to fountains, or collect in cavities, which afterwards overflow, and the water oozing through a thousand cavities, is impelled to the bottom by its natural gravity: this, by the union of various currents is formed by degrees a vein of water. In some countries, however, they cannot be owing to the rains or snow, as in several lofty mountains there are springs and lakes which cannot be produced by this cause; many have an equal supply at all seasons, and even greater during hot and dry than damp and rainy weather. Some other cause may exist, both of their rise and continuance. Many are produced by vapours which collect in the atmosphere, and are driven by the wind, or impelled by the universal power of attraction towards those great bodies. The air abounds with these vapours, which coming in contact with rugged rocks, condense into drops, and thus increase the fountains. But this cannot account for the rise of some springs; for instance, the Danube, Rhine, and other rivers which originate in mountains, and are dried up when they are covered with snow. Springs are formed by a communication between deep caverns and the ocean: having passed through subterraneous channels, the sea-water collects in these cavities, and evaporating through a number of crevices, form into drops, which falling by their own weight, often entirely alter their direction. In situations near the main sea, the water may filter through the ground, and form into springs; they imbibe the taste of the water from whence they flow. But this cannot refer to high mountains, for if the sea-water could rise so high, it would not be so palatable. These and many

other latent causes are the origin of springs. Though nature is simple in her operations, yet she does not employ a single cause only to produce one effect. Her simplicity consists in being contented with as few as possible, but does not preclude the occurrence of several auxiliary causes to advance the end which she at first designed.

Nov. 16.

The Hair of the Head.

THE construction of the hair of the head deserves minute attention, and discovers evident traces of the Divine wisdom. To each hair belongs an oblong fine thread, and a knot, thicker, but more transparent: the thread is the body, and the knot the root of the hairs. The principal hairs have the root and part of a thread inclosed in a case or membrane, of a size large enough to leave a space between a root and case; the root is divided into external and internal parts, the former is a pellicle of little flakes, the latter a glutinous fluid, containing some small fibres: this is the marrow; from its exterior part proceed five or six threads, which are fine, clear, and often twice its length; besides these are other knots, of a viscous nature, and dissolved by warmth. The body of the hair proceeds from the interior of the root; having three distinct parts, the case, tube, and marrow; near the pore of the skin through which it passes, it is entirely enveloped in the pellicle, which forms a little tube. The epidermis precedes the hair, and guards it, like a sheath

from injury, while tender. The rest of the coat is a singular substance, and particularly transparent towards the point. In young hair the coat is soft, but grows afterward hard and elastic, and makes a great noise when it is cut. The exterior coat conceals several small fibres, which extend from the root to the point; they are united to a point by elastic threads: these fibres form a tube, that contains fluid and solid substance, which constitute the marrow The construction of every part of the human frame displays the wisdom and perfection of the Creator; and the hair of the head is a particular demonstration of this.

The minutest members become necessary, when considered in connection with the rest, or when their formation and end are investigated by an observer of the works of God. How many condemn these instructive objects, and perceive not the evident traces of their Divine Author! But, besides the utility of all our members, we may easily discover the end for which the hair was designed: it is a great ornament to our external appearance, and it evidently preserves the head from cold and damp, which would prevent the natural warmth of the brain; it removes many bodily humours, by insensible perspiration, and preserves the more noble parts from superfluous moisture. How many other latent benefits may we not derive from it! But let us rest satisfied with the discovery of part of the wise designs of Providence: they will afford us rich sources of gratitude for his power, wisdom, and beneficence.

Nov. 17.

System of the Universe.

HITHERTO we have been exclusively contemplating our earth, which is but a speck when compared with the spacious universe. We will elevate our conceptions towards those celestial orbs, before which this habitable globe dwindles into nothing. Let us scrutinize, reflect, and adore! The sun, which is the universal source of life, is placed in the centre of the system, and though stationary in the heavens, revolves round its own axis, from east to west, in the space of twenty-seven days and twelve hours. The planets move round it in an oblong orbit or ellipses. Mercury, which is nearest the sun, is nearly eighty-eight days in performing his revolution round it, but his rays are generally obscured by the sun's superior effulgence. Venus is rather more than two hundred and twenty four-days and describes a larger ellipses. The earth requires a whole year, and the moon is her constant attendant in this annual journey. Mars is six hundred and eighty-seven days. Jupiter, with his four satellites, is about twelve years. Saturn, with his five moons, is the space of thirty-one years. And lastly, Georgium Sidus, which is the remotest planet from the sun, is eighty-two years in revolving round it; has two apparent satellites, and probably many more. But are these the limits of the universe? Certainly not. The region of fixed stars extends far beyond the Georgium Sidus, the nearest of

which is 27,400 times farther from the earth than the sun is. Though this great luminary is ninety-five millions of miles, how many invisible globes may there be between Saturn and the fixed stars!

Is it possible that the sun can be stationary in the centre of this universe, while he daily traverses the firmament in twelve hours? We behold him rising in the east, and declining in the west. Could the earth perform an imperceptible revolution? This is an illusion of the senses. Do we feel the motion of a boat? and when in a boat or carriage, does not every object appear to have a retrograde motion, when in reality they are immoveable? How the senses are deluded! But if reason must acknowledge the truth and admirable contrivance of our system, nature always employs the shortest and simplest methods. By the revolution of our earth around the sun we can account for the various situations and motions of the planetary bodies. It is much more natural to suppose that the earth revolves round its axis in twenty-four hours, than that the sun and planets move round the earth in that space of time. One incontestible proof of the truth of the Copernican system is, that the motion and distance of the planets depend upon the sun, and not the earth. If it were otherwise, it would be contrary to that universal harmony which appears in the works of the Creator.

These reflections are calculated to excite the most elevated conceptions of the great former of the universe, and to sink us in our own estimation. With what pleasure we contemplate these grand objects, till we are lost in wonder and admiration of the in-

finite Jehovah! Our finite understandings are too limited to receive a perfect knowledge of the system of the universe, but are sufficiently acquainted to convince us that this structure was formed by infinite wisdom and knowledge, that it is most uniform and beautiful in its plan, and conducive to the happiness of the inhabitants of these various globes.

Nov. 18.

Lobsters.

LOBSTERS are worthy our attention, if they were of no value for food. A little before this period of the year females undergo a considerable change; they discard their old shells for new ones, which is called moulting: this is the case with all crustaceous animals. The lobster increases in size, while the shell remains the same, which obliges it to endure this painful operation at the same time they change their stomach and intestines; for it then appears to devour its former stomach, which lessening by degrees, is replaced by a new one. While it is consuming, the small white stones, called, improperly, crab's eyes, diminish in size till entirely lost; probably they empty them as a remedy for disorders in their stomachs, or this matter may be of a petrifying nature, and produce the new shell. Except at this time, they continue at the bottom of the water near the shore. In summer they approach the shore, if not impelled by hunger to seek deeper water, where they catch their food with the claws which nature has given them. Sometimes their claws equal the size

of both head and body, and they have the power of forming new ones if they are injured or broken; and cast away old ones, if they become inconvenient. This they can do with great ease if thrown on their backs. If the shell be broken, and the flesh bruised with iron pincers at the third or fourth joint of the claw, the animal shakes it till it drops off; immediately a glutinous substance covers the wound, which staunches the blood: without this it would perish with loss of blood. This envelopes the shoot of the new limb, which appears at first like a little excrescence; by degrees it is formed into a perfect claw. The lobsters become pregnant about autumn, which may be perceived when they are opened about that season: a short time afterwards little eggs, like hemp seeds, appear, beneath the tail, fastened together by little fibres: the first appear in December, and increase to hundreds, growing gradually larger as the warm weather advances, and before midsummer live lobsters, about the size of an ant appear among the eggs, and remain clinging to the fibres till all are hatched. When separated from the mother they fasten to the roots of trees, which are buried in water near the shore till they are sufficiently large to enter into the sea. This is the most wonderful creature in existence! whose skin is a shell, which it annually exchanges for new armour; whose flesh is contained in its legs and tail, the hair is on the outside of its breast, the stomach is in its head, is regularly consumed to make way for a new one; which carries its eggs in its body till they become fruitful, and then beneath its tail; which can cast off its eggs

when they are inconvenient, and produce others; and lastly an animal whose eyes are placed in moveable horns! Many of the properties of this singular creature will long be concealed from human investigation; but it offers another subject which claims an acknowledgment of the wisdom and omnipotence of the Creator.

Nov. 19.

On the Structure of the Human Body.

If we investigate the structure of the human body, we shall perceive that every part is adapted to its appropriate end. The wise Creator has not only rendered the members subservient to our comfort, but ornamental to our external appearance. In the first place, every part is most properly situated to perform its appointed function. This machine was endowed with an actuating power, that it may require no exterior force to put it in motion; every limb should perform the will of the mind with the utmost speed and facility. The bones are all united; but to prevent any difficulty in moving them, they are divided into joints. Each bone is round at the end, and placed within the cavity of another bone, where it turns with the utmost ease, being covered with a polished gristle, and moistened with an unctuous humour, which prevents the gristle from rubbing. How amazing it is that they should be so firmly set as never to separate, though they bear so large a burden, and the hands such enormous weights! In the situation of our various members, the Deity has

designed our comfort; the commands of the soul are immediately obeyed by the organs of the body, and the senses inform it of its several interests. The eye being the centinel of the whole frame (if I may be allowed the expression,) occupies the highest station, and can perceive every thing that passes. The ears are also in a distinguished part, placed on each side of the head, and continually open to convey to the mind every impression of sound. As the food passes from the mouth to the stomach, the organ of smell is placed about it to guard it in union with the eye, from receiving any thing unwholesome. The sense of feeling is diffused through every part of the body, that we may distinguish pleasure from pain, and salutary from pernicious things. The arms being the ministers of the soul's desires, are therefore situated near the chest, which is the strongest part of the body, and without being too distant from the lower parts are most conveniently placed to answer their appointed ends, and to protect the head from injury. Lastly, the Creator has attended to the elegance of the body; this consists in the harmony and proportion of the limbs, and the beautiful mixture of colours in the skin. Those parts of the body which are in pairs, are situated on opposite sides, of equal height, and exactly similar to each other; whereas the single members are placed in the middle; and this proportion is universally preserved, the length of the sole of the foot is the sixth part of the height of the whole body, as the face makes the tenth. Infant's heads are larger in proportion to the rest of the body, that being the nobiest part, and the seat of four senses,

it should soon arrive at perfection, especially as, being entirely composed of bone, it does not extend so much as the fleshy part: in childhood every limb grows with the most exact proportion in its length and breadth, according to the size of the body.

Oh, man! admire the admirable construction of thy body! observe the connection between thy limbs, which never interfere with their separate functions! Their situations are best suited to their purposes, and to conduce to their mutual benefit. The organs are the springs which actuate this strange machine, and they unite together to fulfil their destined ends. Do not destroy this beautiful machine by intemperance and excess; degrade not thy intelligent powers by the indulgence of detestable passions; but let thy body continue as a proof of thy Creator's wisdom. Never neglect thy immaterial part, which, though polluted by sin, may be purified by the blood of Jesus! This alone can compensate for the dissolution of the corporeal part, when that returns to its native dust.

Nov. 20.

On the Order and regularity of the course of Nature.

THE world every where discovers traces of a Supreme and Omniscient intelligence which directs the whole, and determines all things by infinite wisdom. Thus the universe once formed, constantly fulfils its first design without the change of one of

its established laws! This observation seldom applies to the works of man. The best constructed machines are soon injured and want repair, because defective in their construction; for the most skilful artist cannot obviate or even foresee, the accidents to which his work is liable. The world is also a machine, composed of countless parts, divided into luminous and opaque globes, inhabited by myriads of various living creatures. The opaque bodies have a regular motion in the circle prescribed round the luminous bodies, deriving from them light and heat, day and night, seasons, climates, and nourishment, according to the wants of the various inhabitants. The situation and mutual gravitation of the planets are so diversified, that it seems impossible previously to decide the time of their return to the point they first left, and renew their periodical course; and yet neither their various phænomena, nor the numerous movements of these globes for many ages have occasioned a single concussion or irregularity of any kind. The fixed stars are the same now as at the creation of the world; their distances, projection, force, ascension, declination, parallas, and direction the same. The sun also is the same, with his days and nights, years and seasons! An incontestible proof that in the arrangement and regulation of the celestial orbs, the author of nature stretched his unbounded ken beyond the utmost limits of time. The same may be remarked of the revolutions and changes of climate, to which our earth is annually subject; for though at first its various transitions may appear the effect of chance, as if from accident alone the waters overflow the earth, and thus effect

important changes on its surface ; yet it is certain, that each preceding modification is the cause of the next and the latter of the following, and has been from the commencement of the world. Nothing is more calculated to convince us of our ignorance of the causes of natural events, and their connection with the future, than the various temperature of the air which influences so much the aspect and fertility of our earth. In vain we repeat our meteorological observations ; we can form no certain rules even for another year. Yet these variations, this apparent confusion of the elements, does not destroy, or even materially alter our globe, or render it a frightful chaos, but conduces to the preservation of its fertility. Yet, as each modification is dependant on the former, it is evident the elements were not the effect of blind chance, but have been, and will still continue to be, fixed and measured by infinite wisdom. This universe was not composed of disjointed particles ; it is a perfect whole, which was constructed by a supreme intelligence. If we behold the myriads of animate beings, whose natures and designs are similar to ours, and frequently connected with us, if we perceive an infinite variety of creatures which are also in some degree mutually connected, if we acknowledge that these animate beings receive all that nature requires by the union and action of the elements, or if we elevate our thoughts, and reflect on the connection between our terraqueous globe and those celestial orbs which constantly preserve their various revolutions with the utmost regularity and harmony, we shall be struck with admiration at the grandeur, uniformity, and

beauty of creation, and the wisdom of its Divine Author. Our slight conception of these sublime subjects is but a glimmering ray emitted from that heavenly effulgence by which the now mysterious ways of Providence will hereafter be amply elucidated.

Nov 21.

Winter in the Northern Countries

THE period arrives when discontented people begin to complain of the rigours of winter, and murmur at the severity of the cold, as incompatible with the Creator's beneficence. The affluent repine at the dull monotony of nature, the poor at the increase of their wants and poverty. Yet, however they may exaggerate the distresses of this season, at length they must own that a merciful God has allotted their situation, especially when they compare it with that of other nations. Some northern countries are neither blessed with spring nor autumn, and the heat and cold are equally excessive; the latter is so extreme, that spirits of wine in the thermometor is congealed. When a warm room is opened, the air which enters turns the vapours into snow, and they appear like white clouds; if any one quits the house, they are almost pierced through with the keenness of the air. Nature seems dead, and the inhabitants remain within their hovels. Sometimes a sudden frost deprives people of a limb or sometimes even of their lives, if timely assistance be not procured. A fall of snow is still more dan-

gerous ; it drives with such force, that the path is hid, the trees covered, and the eyes so blinded, that people are in constant danger of falling down dreadful precipices. It is perpetual day during three summer months, and constant night during the same space of time in winter.

How could we endure such a climate as this, if we repine at our moderate temperature. It is certain we are ignorant of our happy state, or we should be more contented. Though winter may be gloomy and severe, yet our natures are so constituted, that it is our own fault if we cannot bear it. Why then has the Deity created millions of human beings to live in continual terror from the ravages of nature? Why has he not rendered all his creatures equally happy? Foolish inquiry! We are mistaken if we think the severity and length of their winters, render the inhabitants of the poles wretched. Tho' poor, they have few and easy desires to gratify, and are contented while surrounded with their icy rocks ; unacquainted with those comforts which the southern nations deem essential to their felicity. If their sterile soil will not yield them the various productions of the earth, yet the sea is particularly liberal in her gifts. Habit inures them to cold, and enables them to defy the stormy ocean. Nature is also profuse in some of her donations. The deserts abound with savage beasts, whose fur guards them from the cold ; the rein-deer provides the necessaries of life, and is easily obtained. When the sun conceals his beams beneath the veil of a long night, the aurora borealis sheds a glimmering ray to illume its darkness. Perhaps they esteem themselves the happiest

creatures in the world, and commiserate our situation as we do theirs.

Thus we find there is such an equal distribution of comforts and inconveniences through every part of the world, that it is difficult to determine which deserves the preference. If we consider them in this light, there is no country which is partially blessed whether the sun darts over it his vertical or oblique ray, or whether it is covered with eternal snow. In one country the comforts of life are more abundant, in another it is just the reverse; but though they are deprived of these comforts, yet they are exempt from the temptations, anxieties, and bitter remorse, which often prevent the enjoyment of them: thus they are amply compensated for the pleasures they lose. We are certain that Providence has bestowed on all his creatures all necessary support and happiness, has adapted their constitution to the climate they inhabit, and constantly provides for them with paternal care.

Nov. 22.

The Transformation of Nature.

Every thing in this transitory world is liable to change, and continually assumes a different form; and some bodies pass by regular gradations through the three kingdoms of nature. Every year millions of bodies are intermingled, and return to dust. Where are those flowers which decked our fields and gardens during the vernal season? One species

ade away to make room for another: the fragrant violet, the harbinger of spring, droops its modest head, and yields the palm to the tulip and the rose; these disappear to give place to the others, till the flowers have all bloomed in their turn. Thus it is with the human species! One generation dies away and another rises up. Every year consigns millions of the human race to their native dust, and new ones spring from these putrid remains. The salt and oily particles of which they are composed melt in the earth, while the more subtle ones, being attracted by the sun's rays, rise in the air, and mix with other substances, or are dispersed by the wind, and fall in refreshing showers or fructifying dews. The grosser parts mingle with the dust, nourish the grass and vegetables that supply the flocks and herds, or flow in luxuriant streams, so pleasant and salutary to man. These perpetual transformations in nature evince that the Creator has designed that nothing should be lost. The meal on the flower is but an inconsiderable part, yet this is employed by bees to make their honey. The liberal gifts of the earth would soon be exhausted, if they were not to return again. All organised bodies dissolve, and turn to dust; all the volatile parts which are scattered in the atmosphere, are joined again in new organised bodies; which in their turn undergo the same revolutions. These incessant variations commenced, and will terminate only, with the world. But the most interesting is that which connects ourselves. Originally our bodies were much smaller than at present. The embryo in the womb is extremely diminutive: we are larger at our birth, and after-

wards increase to fifteen or twenty times the size, consequently many other particles must be united to effect this end. Our perpetual want of food proves a perpetual waste of the parts, which must be repaired by sustenance: a vast deal evaporates insensibly, as appears by the experiment which was made by an eminent physician upon himself. That in eight pounds of food, which is a man's daily allowance, but a fifth part turns to any substance, the rest is carried off by perspiration and other excretions. From hence we may conclude, that at the end of ten years few of the present particles will remain. At length our final change will take place; and after our bodies shall have rested in the silent tomb, the bright morning of the resurrection shall arise, and this shall fix our state, immutable, through all the endless ages of eternity. Let us rejoice in the pleasing anticipation of that happy haven, where, free from all the chequered scenes of life, we shall rest for ever on the bosom of our God. Let us view with composure the various vicissitudes of this temporal state, which are indispensibly necessary to our progress in, and attainment of perfection and felicity.

Nov. 23.

The greatness of God in small Things.

Those who love to reflect on the works of the Creator, will trace his forming hand not only in the celestial bodies, but in the minutest parts of nature.

He will equally adore a divine intelligence in the spider's web as in that gravitation which attracts the planetary globes towards the sun, their centre. Our researches into these worlds in miniature are rendered easier by the invention of the microscope; and those who are deprived of the use of these instruments, may peruse with satisfaction some remarks on microscopic objects. Let us investigate the inanimate world: survey the mosses and the grass, they are formed of delicate threads and small particles; there are innumerable kinds, and they are composed of many little distinct parts. If a hexagon, the size of an inch, have a hundred million of particles, how many must a mountain contain! If millions of drops of water may hang on a needle's point, how many must a fountain, a river, or a sea contain! If a lighted candle emits in a moment more luminous particles than there are grains of sand, how many must issue from a large fire in an hour's time! If one grain have several millions of particles of air, how many must there be in the human body! If sweet scented bodies exhale enough of fragrant corpuscles to spread the perfume to a great distance, without any apparent dimunition in their weight, the mind could never compute the number of particles! We will proceed to animated nature, here the scene extends to infinity: during summer the air swarms with life, every drop of water is inhabited, every leaf, and perhaps every grain of sand, is a colony of insects; millions of creatures are supported on a plant, a grain, or a flower! Immense swarms of insects collect together in a very limited space How many must there be, in proportion, through the wide expanse

of the air! How many less worms or insects crawl upon, or underneath the ground, and are numbered only by God!

Who can reflect on these subjects, without being struck with astonishment at the greatness and extent of the works of God. All nature teems with life and vigour; and every part of the creation serves to display the creative energy of a great and Holy God. If we were not convinced by experiment, should we conceive there were animated beings a million of times smaller than a grain of sand, endowed with their necessary organs? Some shell-fish, even through a glass, appear about the size of a grain of barley, and yet they live within a bony substance, which has eparate divisions.

The mite is very small, and yet by the microscope we perceive it a hairy animal, perfect in all its parts, and endowed with every thing essential to its existtence. But though the mite is extremely small, there are some still less. It is worthy observation, that those glasses which point out faults in the works of art, display the regularity of the works of nature. The spider's web is exceedingly fine and tenuous; it is computed that 36,000 threads would be the size of sewing-silk. Each of the six papilla, which produce the viscous liquor which forms a web, are composed of lesser papilla, which serve as wire-drawing irons for the threads to pass through, so numerous, that the strongest consists of six thousand less threads. How amazing the thought! But suppose our glasses would magnify some million times more than those which increase the mite to the size of a grain of barley, what wonders we should perceive! But then it would be presumptuous to suppose we had found the

utmost extent. All creation has a kind of infinity, and the more we contemplate the more miracles of power we find. The conception is lost in the two extremes of great and small, and we are ignorant which is the most admirable, the starry firmament, or those creatures which are almost imperceptible. We should esteem it our highest pleasure to reflect on the works of God, and our toil will be amply recompensed by the pure and exalted pleasure they afford. It will increase our desires after a blissful realm, where the wonders of his creative arm will be plainly demonstrated without any foreign aid. There we shall perceive the admirable connection and harmony through all its component parts, and chaunt the endless song of praise before his holy throne. There great and small will be brought to a level, and all his creatures will experience an equal share of felicity.

Nov. 24.

The Weather grows gradually Cold.

Every day the cold increases; the preceding month lost part of the autumnal warmth, but it was cheered by the sun's enlivening ray. The days visibly shorten, and the earth no longer retains its heat, the upper region is impregnated with cold: this is proved by constant experience, and yet how insensible we are of this visible demonstration of the Creator's wisdom. This gradual progress from heat to cold is necessary for the preservation of the human frame. If there were a sudden transition from the heat of summer to the severity of winter, we should

be frozen to death; for how liable we are to take cold in the cool damp evenings which succeed a summer's day. With what beneficence has the Creator bestowed such a temperature that our health is guarded from any injury arising from the variations in the seasons! Those animals which cannot endure the cold would perish by a sudden advance of winter; one night would destroy two-thirds of the birds and insect tribe, with their nests and eggs, which now prepare for it, being warned by its agradual approach. The autumn bids them quit their native groves, and migrate to warmer climes, or lulls them into a long slumber. The sudden deprivation of the summer's heat would be fatal to our fields and gardens, every plant would perish; spring would produce no flowers, nor summer yield her fruit. This imperceptible transition from heat to cold is therefore essential to the preservation of nature in general. Presumptuous man, amidst his murmurs, would learn too soon, could he even derange a single wheel, that far from improving, he would occasion irreparable mischief. The operations of nature are gradual; one event succeeds another by regular and ordained degrees. Order is the principle by which God directs the world, and produces that beauty and perfection which appear in all his works. In every season be it our employ to mark the fair creation of his hand, to trace his wisdom and beneficence unbounded, and repress those murmurs which would give him just offence. Thus engaged, we should discover order, wisdom, and goodness pre-eminent in those objects we at first deemed most imperfect; and irresistible conviction would at length compel this general acknow-

ledgment, "that all the paths of the Lord are "mercy and truth, unto such as keep his covenant "and his testimonies."

Nov 25.

Reflections on Snow.

DURING the dull winter season the ground is often covered with snow: every one sees it, but few inquire its nature and use. Such is the fate of many things; which, though common, are most valuable and useful to us. Let us become wise, and devote a few moments to the examination of snow. It is composed of light vapours, congealed, and falling in flakes of various sizes; in our climate they are large, but in Lapland they are so small, as to resemble fine dust, occasioned by the intense cold, the increase of which diminishes their size. The smallest flakes are hexagonal, others of eight or ten angels, and some of an irregular form, which is best observed if they be received on white paper. This variety of shape is not yet accounted for, but the whiteness of the meteor is easily explained. Snow is thin and light, composed of many parts, more or less compact, and full of air; this substance does not admit the sun-beams, but strongly reflects them, which makes it appear white. New fallen snow is proved to be twenty-four times lighter than water. In spite of most intense cold it evaporates considerably. It has been doubted whether the snow falls at sea, but those who have traversed the northern ocean prove the fact. It is known that lofty moun

tains are never free from snow, as it often falls on heights, while the rain of the warmer regions of the air waters the plains below. Snow has various uses. The all-wise Creator has ordained that the plants should be fenced from the cold of winter by this spotless garment, soft as wool, and possessing moderate warmth. The various salts which in common with all vapours it contains, enrich the earth: the melted snow also washes away every thing injurious to the plants, and supplies the almost exhausted springs and rivers. From these reflections let us learn less to lament the gloom, and more to admire the advantages of winter. Let us raise our eyes, beaming with joy and gratitude to that beneficent Being, who distils his blessings from the clouds, and learn how inexcusable our murmurs, when it depends upon ourselves alone to find in every scene of nature the fairest traces of divine wisdom and goodness.

Nov. 26.

Sleep of animals during Winter.

NATURE, deprived of so many beautiful and living ornaments, appears inanimate and dead. Many animals have vanished, and are buried in profound slumber for the winter. This is the case with snails, bugs, ants, flies, spiders, caterpillars, frogs, lizards, and serpents. It is a mistaken idea that the ants lay up winter provision: the least cold benumbs them till the return of spring and thus renders a

store unnecessary. The summer collection they make is, to build their dwellings.

There are also many birds now which conceal themselves for the season, on the ground, or in caves; this, at least, is said of the different kinds of swallows; and some beasts also bury themselves in the ground during autumn, of which the most singular is the mountain-rat, a native of the Alps. Though it loves to inhabit the regions of ice and snow, it is extremely susceptible of cold, for which reason it retires in September or October to its subterraneous dwelling, and remains there till April.

The plan of their winter residence evinces much art and precaution: it consists of a double gallery, which terminates in another close apartment, where they live. One of their wings is in a sloping direction beneath their habitation, here they leave their excrements, which the wet carries off: the other is higher, and forms the entrance: their dwelling is lined with moss and hay; and having well closed this entrance, they compose themselves to rest, and remain without eating while they are in this state of insensibility. At this time they are very fat, and weighing twenty pounds, but by degrees they become thin. Nature has furnished them with valves, in the form of a ring, which retain the excrement till they awake. It is said, that as soon as they feel the cold they repair to a spring, and drink copiously, till the water passes through them perfectly clear. This is the effect of instinct, to prevent the corruption which such long accumulated matter in their stomachs would occasion. When their retreats are discovered they are found

rolled up and sunk in hay, that they may not breathe the damp air. While thus torpid nothing affects them, and they may even be killed without pain.

Bears eat moderately at the commencement of winter. They are naturally fat, and at this time particularly so, which enables them to bear abstinence during their long repose. Badgers and other animals, by instinct, pursue the same methods: while quite young and inexperienced they foresee and prepare for this event. In their calm retreats they know not want, or cold, or hunger: summer is their only season. It merits observation, that all creatures do not sleep thus, but only those who can sustain abstinence. If winter surprised them suddenly, and they, though benumbed and exhausted with cold and hunger, still survive, we should only wonder at their strength of constitution. But their previous knowledge, the precaution they evince, must be ascribed to instinct—the gift of that creative power whose wisdom and goodness have liberally administered to the wants of universal nature, by a thousand various ways which imagination would in vain attempt to discover.

Nov. 27

The use of storms.

PROBABLY there are many who rank the winds and tempests amongst natural evils, forgetful of the advantages we derive from them, and the misery which would attend the deprivation of them, as designed to purify the atmosphere. To be sensible

of this, we need only remark the temperature of the season: what thick unhealthy fogs! what damp dark days! Storms are designed to dissipate these injurious vapours.

The universe is subject to similar laws with man, who is himself a little world. Our health very much depends on the agitation and mixture of the humours, which prevent corruption. Thus it is with the earth. Perpetual motion is requisite to preserve the air from being noxious, and this is effected by the winds; not by gentle gales, but by storms and tempests, which assemble the vapours from remote regions, forms them into one mass, and thus intermingle them.

Storms are even beneficial at sea, by exciting violent agitation, which is necessary to prevent that degree of putrefaction which would be fatal to its scaly inhabitants, and offensive to the traveller. Why then should the sea be excepted, such a common receptacle for every thing disgusting, and wherein so many animal and vegetable substances putrify? If it were not in perpetual motion, it would stagnate, and its effluvia would become intolerable. Motion is of as much consequence to the sea as circulation is to the blood of animals. Storms most effectually answer this end; and the advantages which result must be evident to all mankind.

It is on these accounts that we ought not to consider them as destructive plagues, or as the fierce commissioners of Almighty vengeance. Most true it is, that storms have often buried costly treasures in the deep abyss, blasted the rising harvest of the farmer, destroyed the gardener's hopes,

devastated whole provinces, and spread terror, desolation, and horror to a fearful extent. But what is there in nature entirely exempt from inconveniences Shall we consider the sun amongst our evils, be cause he leaves the earth barren for some months and during others withers our grain with his intense heat? The phænomena which ought to alarm us are those, the evils of which preponderate over their advantages; but this cannot be said of storms, if we reflect on their various uses. Let us then with humble gratitude confess the plans of God are wisdom and that contentment becomes us best. Happy he who is convinced that all throughout the universe promotes the general and individual good, that occasional evils are more than counterbalanced by innumerable advantages, and that the very chastisements of heaven are but blessings in disguise.

Nov. 28.

Accidental Events.

To speak correctly, nothing is the effect of chance, and what we demonstrate thus is only some unforeseen circumstance, which arises from the unexpected union of several causes. This is constantly proved; and the fortunes of individuals are often reversed by some trifling event. In a natural sense, "the race is not always to the swift, nor the battle "to the strong," nor does success attend the wisest undertakings; but this rule is not without exceptions, and sometimes just the contrary occurs. How mournful would be the fate of mortals if

they were not governed by an intelligent Being, who directs all their affairs, and suffers nothing to be left to chance. The destiny of individuals, families, and nations, often depend on apparently trivial circumstances.

If we refuse to acknowledge a presiding Providence over these small events, we must conceive him indifferent in the more important revolutions of the world. We are witness to daily accidents which influence our happiness or misery, and yet we can neither foresee nor prevent them; and from thence we may infer, that they are the allotments of Almighty wisdom. According to the strength of our reasoning powers, he has suffered us to judge for ourselves; but he interposes when our prudence will be of no avail. In other cases our industry should be united with the aid of the heavenly spirit: but in unforeseen events he reserves the disposal to himself alone. His goodness and justice are evident through all his works, and every thing submits to his supreme jurisdiction. Here his wisdom shines with superior lustre. We naturally conclude there is a God when we behold the admirable structure of this terrestrial globe, but when we behold the most important consequences arise from a fortuitous and trivial event, it is a still stronger proof of his existence. Have we not in a thousand instances beheld the lives and happiness of individuals, the fate of nations, the success of wars, and important revolutions in kingdoms, result from unexpected occurrences. These overturn the best concerted projects; and we must own that true comfort alone can spring from a firm dependance upon Providence;

whatever adverse storms may overwhelm our hopes, he will protect and deliver us. This joyful thought should fill us with the profoundest reverence and perfect confidence, and lead us through all the vicissitudes of life to implore our Heavenly Father. This thought should repress every motion of pride, and inspire the rich and great with that proper and religious awe which is due to him who could in a moment destroy the fairest schemes of felicity, and sink them low in the dust by a thousand latent means. This should expel every anxious thought from our bosoms, as the wise Creator can produce good out of evil. If he will the happiness of his creatures, no obstacle can prevent it; he commands, and all nature obeys!

Nov. 29.

The greatness of God.

It is the most laudable pursuit of man to endeavour to obtain some worthy conceptions of the majesty of Jehovah. Our infinite understandings cannot perfectly comprehend him who "contains the seas "in the hollow of his hand, and meteth the heavens "with a span!" Who is at the same time visible to us, and concealed from our view. He is near us, yet raised above our highest ken! he filleth immensity, and thus is constantly with us! But his nature and designs are hid beneath impenetrable darkness. We should cherish the most reverential sentiments of him, and for this end let us compare him with the

most respectable of our fellow-mortals, and we shall perceive his superiority. We admire the power of kings, and are amazed to hear of their great exploits and their influence on the happiness or misery of nations, but how must our admiration be increased when we contemplate the King of kings, who built this spacious firmament, who supports the sun in his orbit, and the stupendous fabric of the universe! We are surprised at the fervour of the sun, the violence of the wind, and the tempestuous ocean, the hoarse thunder, and the forked lightning; but it is God who giveth heat to the sun, who thunders in the clouds, who walketh upon the wings of the wind, who bids the stormy billows rise, and hushes them again to silence. We should respect the learned and ingenious; but what is finite knowledge or understanding in comparison with that of the Supreme Being, who is acquainted with every thing, who counts the stars of the firmament, who knows the course of every crystal drop that distils from the clouds, and with a single glance surveys the past, present, and future! His wisdom is displayed in the construction of the universe, the course of the planetary bodies, and the minutest works of creation! These are infinitely superior to the most perfect works of man. We are dazzled with the splendour which appears in stately palaces, magnificent furniture, costly garments, and the universal reflection of gold, silver, and precious stones. But these are insignificant in comparison with the grandeur of the Deity, "who makes the heaven his "throne, and the earth his foot-stool." All creation is his, and the advantages which this earth affords proceed from his treasury. Existence, and all its

consequent blessings, are at his disposal, to dispense at his pleasure. We respect the potentates whose dominions are extensive, but what is that corner of the earth when compared with that vast universe where our globe appears but a little speck, and which contains such an infinite variety of celestial orbs!

How great is that Being who governs the monarchs of the earth, and who is sorrounded by seraphims, who are eager to fulfil his commands We judge of mortals by their actions, we celebrate those sovereigns who have fortified and ornamented their dominions, who rule with equity, and are successful in all their undertakings; but survey the works of Jehovah, in the formation of nature and preservation of his dependant creatures, his just and universal government, his redemption of the fallen race of man, and his final distribution of rewards and punishments: can any thing equal his goodness? Do not our bosoms glow with pious rapture when we contemplate the omnipotent and incomprehensible Being?

Nov. 30.

Motives of Content.

God is good! and for this reason let our souls be filled with sweet contentment. His works proclaim his love, and the whole universe displays his mighty deeds! The heavens and the earth are witness to his power! The Lord of day, and the pale

regent of the night, all created things, proclaim their great Author!

Take a view of nature; animate and inanimate beings teach us this usfuel lesson—the glory of the Lord! Ask the elevated mountain and the deep cavern, the lofty firmament and abyss of the ocean, the wind and storms, and the worm that crawls on the earth, and they will inform you that his wisdom is infinite, and his power almighty! How can we offer the worthy homage to this fountain of our life and happiness? He gave us our corporeal and spiritual parts, and he alleviates the burden of our sorrows if we be oppressed by adversity, for his kind assistance dispels every evil. O my soul! thou knowest it is so by sweet experience; never let it be erased from thy memory, nor ever fear that thy God will desert thee, who loves his children with parental fondness! Submit to his will, and be thankful for all his dispensations, which will finally accomplish his merciful designs, for his wisdom is infinite, and his means abundant!

DEC. 1.

On the Discovery of the Use of Fire.

IT is Monsieur Buffon's opinion, "that man, by "his own ingenuity, produced the element of fire, "which did not exist upon the surface of the earth." It is true it does not appear a natural production, and it was probably a long time unknown, yet this does not prove that it was discovered by chance, or the wisdom of man. Savages might by accident

produce fire, by friction of two pieces of wood or the striking of a flint; but this does not inter a knowledge of its properties. We may behold the sparks it emits, and yet be ignorant of its enlivening influence, its use in dressing our food, and in various manufactures. Fire is indeed produced by the friction of wood, but why should a rational being amuse himself in rubbing it? If he had done so without design, he must also be placed near some combustible heap; and though he might be sensible of its reviving power, yet it would be succeeded by a pungent pain, being entirely ignorant of its effects. If this element had been discovered by man, his name and country would have been enrolled in the pages of history, and be as universally known as the comforts which result from this discovery. It is fabulously reported, that Promethus was accused of sacrilege, having stolen fire from heaven. This gift of heaven has been diffused through all the world; and the Romans had consecrated vastals to preserve it constantly burning on their altars; which proves that this invaluable boon was received from the hand of God. Why should we suppose that the beneficent Creator would suffer his creatures to undergo such dreadful inconveniences, which could so easily be removed. It is much more natural to suppose (as the scriptures expressly say,) that God who commanded him to offer sacrifices, rewarded this first act of obedience by a visible token of his acceptance, to revive his drooping hopes. Nothing could be more proper than that celestial fire which consumed the sacrifice at the consecration of the tabernacle, and which was never to be extinguished. A striking emblem of divine vengeance, mingled

with forgiving mercy towards his penitent creatures, evinced the beneficence of the Deity by the gift of this useful element, which he would probably never have discovered by his own wisdom.

DEC. 2.

The Time in which the World and Mankind were Created

ACCORDING to the scriptures, the world has been created about 6000 years, and those who fix its æra to a lower date judge contrary to reason. Moses has transmitted to us a true account of the period of its creation; and the history of the origin of the antients is erroneous, for it does not extend beyond the deluge. The chronological books of the Chinese are entirely fabulous; and the most recent historians among the Phœnicians was Sanchoniaton, who lived after Moses.

The Egyptian history begins with Ham, the son of Noah; and the books of the Jewish lawgiver boast the greatest antiquity and authenticity. This world would be more populous if it were older; for though population has constantly increased since the deluge, yet the earth could contain three times the number of its present inhabitants. Five thousand millions might exist on this globe, yet it is computed that the number does not exceed 1080 millions. Asia has 650 millions, Africa, and America 300, and Europe 150

None of the arts have been invented more than

2 or 3000 years; and it was necessity which prompted mankind to exert their endeavours to discover them, that they might indulge themselves in luxury, and pleasures, or to gratify those fictitious wants which are the offspring of fruitfulness and plenty.

History informs us of more distant times, when the most necessary arts were unknown, and the beams of science scarcely began to dawn. Four thousand years ago mankind was involved in the profoundest ignorance, and according to the progressive improvement which has since been made, we may fix the period when the human species were created. If they had existed previous to that time, the most useful and indispensible art would not have been concealed for so many ages; on the contrary, the human mind must have developed all its instinctive powers. This is another argument in favour of our former assertion, that Moses has given a just idea of the birth of man. It is ridiculous to suppose, that for many thousands of years mankind was plunged in the shades of ignorance, and roused on a sudden from their lethargic slumber to invent those arts which conduce to the comfort and felicity of existence.

We should also add another circumstance: the principal part of Europe was covered with extensive forests, and Germany was one entire wood, with few vestiges of the industry of man. The ground could only be tilled in the empty spaces between the trees, and they had no constant habitation, separate property, and there was no fruit but acorns.

If we compare the inhabitants of antient and

modern Germany, we must exclude those who dwell in the towns and villages. Consider the colonies which Germany has sent into other countries, and observe that it could not have had the tenth part of its present state of cultivation, nor, consequently, the tenth part of its present inhabitants, as most of the antient forests have been converted into arable land. Its population must have been greatly increased, yet the forests which extend from Germany to the north-east of Asia, and those in Africa and America, prove that this globe could contain a much larger number of inhabitants. The further we retrace antiquity the more we discover an uncultivated soil, and a thinly peopled world: and this proves that it is not eternal, or it would have been in its present state from time immemorial.

Dec. 3.

The use of Wood.

Though we derive many advantages from the fruit or shade which trees afford, yet its principal use consists in the wood itself. It is so abundant, that we may say with propriety that God is continually providing us with an ample supply of this essential article. It is so pliable that we can mould it into any form, and sufficiently hard to retain the shape we give it, and when properly prepared it affords us every convenience and ornament. But these are only to gratify luxury: its most important advantages result from its strength and solidity, so

that we can use it for the most necessary purposes of life; for though nature has furnished a great quantity of stones and marble, yet it requires considerable expense and labour to dig them from the quarries, and carry them to any distance, while the largest trees may be removed with comparatively small difficulty. Even in sandy and moist soils we may raise a firm foundation for a wall, by sinking wooden piles, sixty or ninety feet long, into the earth, which without this precaution would be undermined. These piles form a forest of stable, and sometimes, incorruptible trees, which can support the largest and most cumberous edifices. It is timber which sustains the brick, tiles, and lead, of which the roofs of our houses are composed: it is also the preservative of life, as it is our principal fuel. Though the sun is the soul of nature, it can neither dress our food nor dissolve our metals, and fire is in some respects its substitute, in that degree which is most agreeable to us. Our blood would congeal with the severity of the winter nights, the bleak north wind, and the damp and unwholesome fogs, if we were deprived of its enlivening warmth. How indispensible a thing is fuel! Was it not to conduce to our happiness that the Creator covered one-half of this terrestrial globe with forests? and yet we are unmindful of this mercy. Do we acknowledge the favour which the Deity has conferred upon us in revealing its various properties? Are we sufficiently thankful for this blessing? or do we disregard it because it is continually renewed? It is true that wood is not so rare as gold and diamonds, but this does not diminish its real value. We should be particularly thankful for the abundance of wood

and the ease with which we procure it. This should especially lead us to bless that bountiful hand which has so proportioned its gifts to our necessities.

If we accustomed ourselves to these serious, yet delightful reflections, they would excite incessant gratitude in our bosoms, especially at this season, when the Almighty is affording us those comforts, the remembrance of which should never be erased from the tablet of our hearts.

Dec. 30.

Observations on some Animals.

The Creator has so formed some animals for food, and others as a companion for our lonely hours; they are all designed to our comfort and convenience. The dog is not a despicable creature, independant of its external properties, its interior qualities are worthy of our attention: it possesses the tenderest sensibility, which renders it an agreeable associate for man; it serves its master with vigilance and fidelity, and caresses him with every mark of attachment; it assists us in the subjection of other animals; and, by its superior powers, it evinces a remarkable share of sagacity; it speaks in various and intelligible language. How he welcomes his master's return, and how is this gentle nature changed to ferocity when he attacks a wolf, or pursues a hare, and what precaution he observes in all his motions!

Every part of the sheep is beneficial to man: its milk, wool, flesh, and even bones; and in these respects it is superior to the dog, though it does not boast his pleasing properties. It chews the cud, as it hastily devours its food without being sufficiently macerated, it is ruminated a second time: it has but one row of teeth, which defect is compensated by its number of stomachs; there are four, the most considerable of which is called the paunch, where the food is a little moistened; in the next, which is styled the cap, it is still more macerated, and begins to digest; in the third, which is the tripe, or leaf, it continues till properly dissolved. This is formed of several folds, which prevent any solids from passing; and at length the digestion is concluded in the fourth stomach, called the runnet; here the colour is changed from green to a milky white. The hare is not destitute of sagacity: it chooses a south aspect for its burrows during the severity of winter, and a north one during the summer months; it conceals itself between the ridges of a similar colour to itself, and when pursued by the hounds chooses the most intricate and opposite paths, till it takes shelter in the trunk of a tree, or some thick bush. It employs a great deal of stratagem, and perpetually changes its situation. The pursuit of the stag is more difficult than the hare. Its elegant and slender form, its branching horns, which are more for ornament than defence, its strength and agility, distinguish it above other animals; and it enlivens the gloomy silence of the forest.

When we reflect on the countless multitude of animals which contribute to our happiness and, submit to our sway, it must elevate our hearts

with gratitude to God. The earth is composed of such various soils, that every creature might have its appropriate food. Every kind of soil teems with animated beings which conduce to our comfort. The crumbs from our table feed the hens, which are so useful to us. The flesh of the pigeon rewards our care in providing them with comfortable houses. The swans clear our rivers and basons from those putrid plants which would corrupt them. And the geese and ducks, in return for a scanty allowance of food and a pool of water, yield their downy feathers for our beds. In short, the most sterile spot of ground contains and provides for many useful animals. Can we behold the works of nature, and be inattentive to their beneficent Author?

Dec. 5.

The formation of Snow, and its different Shapes.

Snow is a species of frost, but differs from it in this respect—frost resembles dew which is congealed upon moist bodies, while the snow is composed of frozen vapours, and falls like dew, mists, and showers. The air is often very cold, and this severity is increased by its density and the union of sharp vapours. We may easily conceive how these aqueous particles are frozen, and this facilitated by the clouds, which are generally extremely heavy and numerous during snowy weather, for the heavier the clouds the more they intercept the influence of the sun. From this reason we may infer, that it sometimes snows in summer; and it may actually be the

case that is formed in the upper regions of the air, but the warmth of the lower regions dissolves it, so that it never descends in that shape; on the contrary, during the winter season, the lower parts of the atmosphere have not sufficient heat to melt it, and therefore it preserves its original form. It is very curious in its shape, resembling little stars with six equal rays. It is difficult to account for its regular form; perhaps it is occasioned by the union of the saline particles which float in the air, and chrystalise it. The frozen vapours collecting round these particles serve as a kernel to them, and are of an hexagonal shape. When the cold is extremely intense they fall separately, but when the air is warmer or moister, they become a little soft, and often joining together, form into smaller or larger flakes, in proportion to the number which are united. This is the reason that the flakes are always very small when the cold is most severe. An attentive observer of the works of God will trace the wisdom of the Deity in the exact and regular formation of this brilliant meteor. How should we be struck with astonishment if we were told, at the first sight of snow, that it only arose from vapours, which congealed in the atmosphere! How quickly it is formed! in a moment we are surrounded with it, and the surface of the earth is covered with the multitude of flakes which descend from the clouds, and form a most resplendent appearance. At the same time that it is a source of the most exalted pleasure, and affords ample subject for reflection, it is calculated to justify that assertion of the pious Brooke, "That even "frost and snow have their charms, and winter has "its sweets. None can want innocent and pure

"pleasures but those who are so dull and insensible "that they do not reflect on any thing, or give any at- "tention to the works of God."

Dec. 6.

Winter Plants.

Winter is not destructive to all the vegetable kingdom; on the contrary, the transition from heat to cold, facilitates the growth and propagation of trees and plants. In some immense deserts beneath the torrid zone the scorching heats would entirely prevent vegetation, if it were not succeeded by the reverse; and thus winter is conducive to the fertility of the earth. Even the coldest countries which are covered with snow and ice teem with the most flourishing plants. Many trees are not nipped by the winter frost, which is necessary, that the forests might furnish us with a sufficient quantity of wood; and many plants also preserve their verdure during the severity of this rigorous season. Some flowers flourish beneath the snow: the single anemone, the early hellebore, the pale primrose, the hyacinth, the modest snowdrop, and every kind of moss.

We are informed by botanists, that the plants beneath the torrid zone, if put into a green-house, cannot endure a heat beyond thirty degrees; but they are so insensible to cold, that they flourish all the winter in Sweden, most parts of France, Germany, Russia and the northern parts of China. Mountainous plants, and the vegetables of the cold climates, are withered and destroyed

by heat. Even craggy rocks, which are capped with eternal snows, produce their peculiar vegetables, and the mountains of Lapland and Switzerland, the Alps, and Pyrenees, abound with some species which are natives of no other soil; when transplanted into gardens they attain to a considerable height, but are seldom fruitful. Few of the northern plants thrive without snow; and thus we find there is not one sterile spot in the garden of nature. From the finest dust to the hardest rock, from the equator to the northern pole, every soil cherishes some exclusive plant, every season yields some peculiar fruit.

Merciful and beneficent Creator! grant us a just sense of thy paternal goodness, and perpetual gifts, even during the severity of this inclement season! If we reflected on thy over-ruling providence, we should every where adore that wisdom which is display through all thy works.

Dec. 7.

An Exhortation to Remember the Poor at this Season.

Let those who are sheltered from the bleak north wind by warm and convenient habitations, remember those unhappy wretches who are exposed to all the miseries of indigence. "Happy those who at "this season have a house to shelter them, clothes "to cover them, bread and the fruit of the vine to "refresh them, with a bed of down on which they "may repose and yield to pleasing dreams. Un-

DECEMBER.

"It is our duty to relieve and comfort the Poor"

Dec.r 7th

J. Hicks, sc. Cheapside, Pinxt.

" happy the poor man to whom fortune refuses even " the necessaries of life! Without shelter, without " clothes, often stretched upon a bed of pain, and " too modest to proclaim his wants."

It is our duty to relieve and comfort the poor. What numbers are pinched with cold and hunger, how many are decrepid with age, and yet are compelled to endure the wintry storm, to entreat the assistance of the passing traveller! How many, reduced by sickness, are lingering on a bed of straw, destitute of nourishment, and scarcely defended from the inclement air by a miserable hut! During the rigors of winter the poor have more numerous wants, and therefore a greater claim on our benevolence; and it increases the value of our gifts if we bestow them when they are most required. Nature herself is impoverished, and while she rests we should share the summer and autumnal spoils with our indigent neighbours. As the cold increases our hearts should expand with benevolence towards the wretched, and pour our superfluities into the lap of poverty.

Why should providence have made such an unequal distribution of riches, if it had not designed the wealthy should be touched with the miseries of the poor, and alleviate them with their gifts? Let us not allow them to be more unhappy than the brute creation. Let us ameliorate their situation; let us provide for them, and thus attain true honour. Every one has the power of assisting his fellow-creatures, either by pecuniary aid, or by soothing their sorrows. Let us ensure the God-like pleasure of relieving others. This is no hard task; we must only retract our expenses in

dress and pleasure. How worthy an offering at the shrine of Virtue, if our charity were attended by a conquest of our passions, that we may be enabled to assist the indigent.

Dec. 8.

Nature is a Lesson for the Heart.

The contemplation of nature is a most improving study; it is a school for the heart, for it instructs us in our duty to God, our neighbour, and ourselves. Can any thing excite more profound veneration of the Deity than the thought of his Almighty arm, which supports the sun in its orbit, and controuls the tempestuous ocean? Can we entertain too lofty an idea of that Being who created the starry firmament, before which this globe and man, its principal inhabitant, shrinks into nothing? Should we not dread to offend that Power, whose nod alone could destroy our existence or our happiness? Nature also proclaims, with intelligible language, that God is love. This must inspire us with gratitude for his infinite mercy. It was love that induced him to form this universe, that he might impart some portion of his felicity to other beings. It was love that induced him to create millions of animated creatures, that from the archangel to the worm all might be susceptible of that share of happiness which is adapted to their nature and capacities. Is there any thing in creation which does not display his divine goodness? This is imprinted on ourselves in more legible characters. We are en-

dowed with reason ; and not only the capacity of enjoying, but acknowledging his favours. He has subjected the brute creation to our will ; he has bid the earth yield her nutritious fruit ; and can we disregard these perpetual proofs of his disinterested love, when we daily experience those numerous blessings which support existence, while his felicity can admit of no increase from our imperfect praises? It is impossible that man, who is a constant witness of that supreme beneficence, which is equally attentive to the interest of individuals and the whole creation, can indulge in base and sordid sentiments. If we contemplate the ways of Providence, we must be struck with that mercy which is conspicuous in every creature. Surely that heart must be depraved indeed which refuses to imitate that universal benevolence, "which maketh the sun to rise on the evil and on the good, and sendeth rain on the just and on the unjust."

This should lead us to be impartial in our charitable distributions. And when we reflect on that regularity which is evident through all nature, ought it not to inspire us with the noblest sentiments, and convince us how displeasing all confusion and disorder must be to him? How unpardonable it is to oppose the merciful designs of Providence; ought we not to second them, by endeavouring to correct ourselves? Thus it is that nature becomes a lesson to the heart. If we listen to its dictates, it will teach us that true wisdom which leads to eternal felicity.

Dec. 9.

God's goodness displayed to us in those Things which appear Hurtful.

Man is inclined to wish that he was exempt from misfortune, and could ensure a freedom from every uncomfortable circumstance. But would it afford substantial happiness if he enjoyed the uninterrupted smile of prosperity? We should seriously examine this important question, whilst we guard our minds against the delusions of self-love. If we enjoyed a constant succession of pleasure, it would become monotonous, degenerate into disgust, and be the source of real evil. The adverse scenes of life enhance our blessings, as colours are relieved by shade. If there were perpetual spring, should we be so sensible of its charms? Should we be able to estimate the true value of health, if we were never deprived of it? or taste the sweets of repose without labour, or the joys of a peaceful conscience, if we were never tempted? Difficulties increase our pleasure when we have surmounted them: the heavier the misfortune, the greater is the blissful contrast when we are relieved from it. If fortune were always favourable, we should be resigned to every baneful passion, trade would be neglected, no one would exert his talents, or feel his bosom glow with patriot ardour. If we were secure from danger, how should we learn to be prudent or compassionate? We should soon be intoxicated with pleasure, and forget our duties to God and our neighbour. Are not these gentle virtues far superior to a con-

stant train of pleasureable sensations, which would become insipid by too frequent repetition? He who reclines in the lap of felicity grows enervated and indolent, but let him feel the stroke of adversity and he will soon recover his wonted vigour. How inconsistent are the wants of man! he wishes to attain happiness, yet will not pursue the proper means. When oppressed by the scorching beams of summer we sigh for more temperate air, yet repine when we see the impending clouds which are to bestow the change. Thunder and storms purify the air, and render the earth fruitful, yet we are terrified by the forked lightning. We acknowledge the benefit of coals, minerals, and baths, yet complain of the tremendous earthquake. We would avoid infectious or epidemical diseases, yet complain of those storms which render the air salubrious. We like to be attended by servants, yet wish for a perfect equality of situations among mankind. In short, we would attain the fulfilment of most of our wishes without the proper means.

Let us acknowledge the beneficence of the Deity, even when he allows these frequent reverses in life, from joy to sorrow. Is he not the arbiter of our fate? Is he not our father, whose paternal goodness is displayed even in his chastisements? Is not this transitory state liable to revolutions? Does not experience prove that those events which we accounted evils have really conduced to our happiness? Let us receive the punishments which heaven inflicts with due submission: habit will render them supportable, and we shall at length be sensible of their salutary influence. If we be humble beneath his chastening

rod, at length we shall be thankful for these very trials. This will certainly be the case in another world: we shall have far different conceptions of our former sorrows, and be convinced that without these afflictions, which we now lament, we should never have re-attained the felicity of heaven.

Dec. 10.

Incidental Revolution of our Globe.

Nature is continually varying the appearance of our earth, and many antient monuments prove that in several places its surface is continually sinking in a greater or less degree. The wall built by the Romans in Scotland, quite across the kingdom, is almost buried beneath the ground, and vestiges of it are constantly discovered. The mountains are exposed to the same changes, and sink to lowly valleys, either occasioned by the nature of the ground, or some other cause. Some parts of the globe rise as others fall: a fertile valley is converted into a marsh, where various substances form beds one over another; lakes and gulfs become firm land; and stagnant waters being covered with rushes, seaweed, and other plants, which gradually corrupting, form a mixture of mud and mould, by degrees harden into dry land. Great changes are produced on our globe by subterraneous fires; their effects are shewn in three different commotions, which generally come separately, the first is an horizontal undulating motion, which overturns lofty edifices: these are particularly evident in the water. Ano-

ther species of earthquake is called pulsation; new islands rise from the sea; the earth being heaved with great violence, sinks down again into deep caverns, lakes, marshes, and springs. And lastly, there are explosions, like the springing up of a mine, with eruptions of inflammable matter: these violent shocks occasion great devastation on the surface of our globe, and earth and sea equally experience their effects. The islands which then arise from the ocean are formed of pumice-stones, of calcined rocks, or other substances which issue from some volcano. History informs us of great cities which have been swallowed up by the earth, and buried near sixty feet beneath the surface of the ground. Various terrestrial changes are produced by the undermining influence of waters. The fall of heavy rains loosens much earth from the mountains, which being swept away into seas and rivers, raise the bottom considerably, the course of water is diverted, and even the banks alter their situation. The sea retires, and its former bed becomes a dry continent: kingdoms which are united to the main are removed far from it. Anchors, iron rings, and the wrecks of vessels, which are discovered at a great distance from the ocean, prove with indisputable evidence that the places which are now *terra firma*, were formerly covered by the main. It is most probable that England was once united to France, as that strait is extremely shallow, and the beds of stone very similar. Even climates produce revolutions on our globe; between the tropics the heat and rains are alternate, for six months each. The countries which are near the pole are liable to great

changes by the severity of the cold. In autumn the water penetrates through rocks and mountains, which freezes in the winter, and occasions great havoc by the ice dilating.

These accidental revolutions are convincing proofs of the frailty of our globe. It evinces that the Deity is an attentive spectator of them, and directs the universe with infinite wisdom. From hence we are taught that nothing is permament in this life, and that frequent alteration entirely metamorphoses the appearance of the animate and inanimate creation. One generation succeeds another: some individuals rise while others fall; some are elevated in rank, others are depressed to poverty and contempt. There are perpetual variations in the situations of mortals, and visible gradations in their conditions and faculties. God has destined their separate periods of duration; he has allotted some of his creatures a transient life, others are designed for a longer or eternal existence. With what lustre does this display the wisdom, power, and goodness of the Creator!

Dec. 11.

Sentiments of Gratitude on reflecting upon the Clothing provided for us by providence.

Divine goodness has provided us with clothing, which is composed of the fur or skins of various animals. The sheep's wool furnishes the principal part of our dress, and we are indebted to a worm for our costly silks. The earth yields us hemp and flax

for linen, and the cotton plant with garments of various texture. Yet even these natural products would have been insufficient, if God had not endowed men with industry, and those inventive faculties which enable him to prepare them in such a manner as to render them subservient to his comfort. If we consider the manufacture of linen, we shall perceive that a few yards require the labour of many individuals. It must check our vanity in dress, if we remember what we owe our splendid vestments to the meanest animals, and the industry of that rank of people which we must disdain. Why has the Creator bestowed natural coverings on all his creatures but man? To conduce to our happiness, and to improve our health; that we may adapt our dress to the different seasons; to our situations and professions in life, and the climate we inhabit. Our clothes promote that insensible perspiration which is so essential to the preservation of existence. The necessity of obtaining them is a stimulus to the human mind, and exerts its inventive powers, and it also furnishes us employment for many industrious people. We should therefore be thankful for this dispensation of providence, and at the same time never abuse it. A virtuous man should not glory in his external appearance, but the internal qualities of the soul. Pride conceals itself beneath various disguises; sometimes it exaggerates the most trivial advantages, and prizes those which have never existed. Some display their pride in costly ornaments and rich attire, while others would fain conceal it beneath their tattered garments. The good man would equally shun both these extremes;

the former is completely despicable, and degrades human nature. Our covering was designed for decency and warmth, which was rendered necessary by the fall, and also to distinguish the different sexes.

Dec. 12.

The Clothing of Animals.

God has displayed his forming power in clothing animals in the manner which is most adapted to their various situations and destinations. Some are covered with hair, others with feathers, many with scales and shells, but every species has its appropriate covering, which is an evident proof that all nature was planned by a divine artificer. Hair was most convenient for quadrupeds; their skin is formed of such a texture, that they can lie down on the ground with the greatest facility in any weather, and it also renders essential service to man. The thick fur of some animals is a safe barrier from the inclemency of the weather, and proves a soft bed and warm covering for their young. Birds, and some sorts of insects, are clothed with feathers, which not only protect them from cold and damp, but are ranged in such a manner as to support them in the air, and assist them in their flight; for this reason they entirely cover the body, and are composed of delicate materials. The quills, which are light and hollow, are filled with a marrow, which strengthens them; and their warmth is increased by filaments, which are finer than hair, and interwoven with so

much art, that they give a sufficient substance to the wing. The formation of reptiles are particularly adapted to their mode of life: observe the earth-worm, its body is composed of a succession of small rings, each of which is furnished with a certain number of muscles, which enable it to extend or contract its body at will; under the skin is an unctuous matter, which penetrates through, and renders it less difficult to make its way through the ground than if they had been covered with scales, hair, or feathers. The aquatic animals are equally adapted for the element they inhabit: the formation, hardness, number, and position of the scales, are best suited to their manner of living. Even the most disagreeable creatures have their particular beauty, but the bird and insect tribes have the largest share. If we behold the little fly, its various tints must fill us with admiration; some have but one colour, others are more beautiful, but some superior to the rest are adorned with the greatest variety of colours. What diversified tints has nature bestowed on the plumage of the feathered tribe! In America, the colibri is the wonder of nature, not larger than a fly it is decked with all the tints of the rainbow; its neck is a ruddy red, its belly and under the wings of a gold colour, the legs of a vivid green, and the claws and bill black and polished as ebony: the male has a tuft on its head, with all these brilliant colours united. These the American women wear as ear-rings. We must naturally conclude, that in the formation of birds the Deity designed their utility and beauty. Every animal is so constructed, that nothing is superfluous, every part complete; the plan

is so admirably contrived, that the art of man could never equal it. Is not this an incontestible evidence of the existence of a Supreme Being, whose unbounded wisdom, united with infinite beneficence, is conducing to the happiness of all his creatures?

Dec. 13.

Thoughts upon the Ravages of Winter.

I HEAR the roaring of the distant storm! my blood congeals in my veins! the obscurity of the day produces terror! All unite to render the tumults of nature still more terrific! How often has the boisterous gale blasted the labours of years, and destroyed the stately palace and the lowly cot! How often have the foaming billows buried in their dread abyss those unhappy wretches who have ventured their lives on the frail foundation of the heaving vessels! How often has it rooted up the stately oak! But thou, O God! presidest over all creation! The northern blast is thy messenger, the herald of thy power, and the minister of thy will! If thou didst not restrain its destructive influence, we should continually witness new scenes of horror; and yet the unsheltered cottage braves its fury. Thanks to that powerful Being who rebukes the tempestuous ocean! Thanks to that infinite wisdom which planned creation! Yet it may be questioned why these tumults of nature are permitted. Can perfect wisdom be the author of confusion? or perfect goodness the author of evil? Thus frail

humanity may reason! But what is man that he dares dispute with God? Shall the creature say to the Creator, Why hast thou formed me thus? And because our finite understandings cannot conceive his works, we infer from hence that they are prejudicial. To comprehend them perfectly, we must possess his wisdom. It is surprising that we can perceive even a part of this extensive plan! If there were not a superintending Being, the present harmony of creation would not exist. A Being whose superior excellence surpasses our utmost conception! If the general course of nature conduce to the happiness of created beings, whatever accidental auses may apparently contradict their design, they only prove the contracted bounds of our understandings. To form one perfect whole from the union of those distinct parts of which the world is composed, where such grand phænomena appear, and the various treasures of learning, virtue, and felicity, are so conspicuous, we must acknowledge that this magnificent world was executed by an omniscient, Almighty, and perfect intelligence. The more minutely we observe the works of nature, the more we perceive the goodness of its Ruler! These reflections would lead us to form a very different judgment of the ravages of winter. Even storms, snow, and hail, are linked in the eternal order of things. Reason is displayed throughout. Every thing has its appointed time; and universal harmony is preserved by these revolutions. The storm which terrifies he sailor, repels the water upon barren lands; the sulphurous vapours which are conveyed by the winds to distant countries fertilize the earth.

Thus winter, which appears destructive, reinvigorates the fallow ground for new harvest. Nature enjoys a respite, and is buried beneath snow and ice. Now the beasts of the forest, pressed with hunger, howl more hideously; and the world is concealed beneath the semblance of death. God watches over it, and performs miracles in the midst of these terrific scenes. The sparrow is preserved by his beneficence, when it can find no provision. The earth is no longer prolific, but his bounteous hand, which is ever open, procures us bread and water, and creates for our supply those things which did not exist before.

Dec. 14.

The Sagacity of Animals in discovering Means of Subsistence for the Winter.

Some animals collect stores during harvest for their winter supply. It appears as if they foresaw the rigorous season, and guarding against future want, calculate how much their families would require when they would be unable to procure any provision. The bees are the only insects which use this precaution; they are very sparing of their wax, because they have no other resource for their subsistence, or the formation of their cells, when the flowers are faded. They also gather another substance, resembling glue, which is extracted from flowers and bitter plants, and which, stopping the holes in the hive, secure them from cold. They never waste, but preserve the present superfluity

for future necessities. Those who have observed them assure us, that when they uncover the honeycombs in winter, they carry off the wax which surrounded the cells, and lay it up for future use.

Amongst the quadrupeds, the field-mice secure winter provisions, and conceal a quantity of grain in their subterraneous dwellings. Magpies and jays, among the feathered tribe, provide for the winter, and collect large heaps of acorns in the hollow of trees. Animals which sleep during the rigorous season do not require any nourishment at that period, and never provide for it: but others are mindful of the future as well as the present, and never fail in collecting a sufficient store. This economy cannot be the result of reflection; for then these animals must possess a superior share of wisdom; in reality their views are confined to the present, and whatever affects their senses. If the present influences the future, it does not proceed from their consciousness. How can we ascribe any foresight to animals, when they have no idea of the revolutions of the seasons, the measuring of time, or the period and duration of winter? Nor can we suppose them to have any faculty of surveying or reflecting on the future, so as to secure a plenteous supply during the severe season, since they always act invariably the same; and every species naturally pursues the bent of its instinct. For example, when the industrious bees continue to fill their honied magazine while the flowers remain, it is not from a persuasion that the time will come when they will be unable to gather this store. How should creatures which have nothing but a sensual perception

judge of the future? It is ordained that these insects collect without thought. Nature prompts them to gather honey and wax; they labour during the vernal season, and when winter arrives their magazines are full. They act like all other animals, almost mechanically, without reflection or design, though they appear to be guided by the rules of prudence. Being destitute of reason, their apparent economy must arise from the influence of a superior intelligence, whose mandates they blindly obey.

It is this which elevates us above the brute creation; we can reflect on the past, and contemplate the future. We can act from reason, be determined by motives, and make choice of the best means. How important it is that we should improve this prerogative. As we are acquainted with the revolutions which await us, ought we not to treasure up rich stores of consolation to render the winter of life more happy? Nothing is so distressing as to behold an aged person, who has spent his prime in a negligent indifference respecting futurity, and who is now involved in all the sorrows of age without one comfort. Such reflections must certainly induce us to ensure our happiness in old age, and our felicity through all eternity.

Dec. 15.

The Advantages of Winter.

Let us reflect on the blessings we enjoy during this rigorous season. Frost and cold prevent the

influence of many noxious vapours which collect in the higher regions of the air, and purify the atmosphere; far from being injurious to the health, they invigorate the human frame, and prevent the putrefaction of those humours which would arise from incessant heat. If vapours were always to distil in showers, the earth would be rendered too moist, our bodies would be too much relaxed, whereas cold is bracing, and promotes the circulation of the blood. Beneath the torrid zone, where the rains are long and heavy, mortal diseases are particularly frequent. In Greenland, which is covered with mountains of ice, and where the winter days do not exceed four or five hours in length, the air is extremely salubrious, and except a few complaints in the chest and eyes, partly owing to the quality of their food, other European disorders are very rare. The constitution of the human frame varies according to the different climates, therefore the natives of the northern countries are well adapted to endure severe cold, and are remarkably robust. Though nature has implanted a principle of activity in the heart of man, which is enforced by the mandates of necessity, yet he loves to taste some sweet intervals of repose. Thus nature also yields to the change of seasons, and delights in it because in the end it conduces to our welfare. Behold our fields and gardens! they are buried beneath the snow; yet this preserves the grain and plants from cold and corruption. The ground requires a respite after having bestowed in the summer a plentiful supply for our winter stores. If we were obliged to cultivate the earth during this severe season, and were not

amply provided for, there might be some ground for murmurs. But our wants are all supplied, and we share the universal repose of nature! How merciful is providence during the winter months! God has endowed man with industry; has given him those inventive powers which taught him how to procure artificial warmth, and taste some portion of the comforts we enjoy in summer. The mercy of providence is no less conspicuous in the annual growth and astonishing increase of wood than in the fecundity of our fields. We have numerous creatures at our command, to render this season more comfortable. The inhabitants of the colder climates are covered with furs of various animals, which particularly abound there. Is it not evident that infinite wisdom foresaw the wants of the different countries, and designed to alleviate them by creating those animals which are best adapted to the various climes? Our beasts of burden carry our provisions; and it is remarkable, that our cattle generally increase when we most require it. Winter does not interrupt commerce, nor the exercise of professions. The rivers become solid as iron, which facilitates the intercourse between countries previously separated. They are not condemned to lethargic indolence and inaction at this period; though the labours of the field are suspended, yet a thousand domestic employments may engage and improve the mind. The sleep of nature prompts them to examine themselves, though they no longer behold the charms of spring and summer, yet in the midst of obscurity and night they have leisure to reflect on the instability of all earthly scenes, and

the wisdom of devoting themselves to the service of that Being who is immutable. Man has now an opportunity to cultivate his talents, to search the inward recesses of the heart, to correct his faults, and lay up a treasure of good works. Happy those who employ this season for so good a purpose!

Dec. 16.

The Elements.

Whether we consider this universe collectively, or examine its distinct parts, we shall have equal reason to adore the power and wisdom of the Creator. It is true our ideas are very confined, and seldom can exceed conjecture, but this is sufficient to prove the omnipotence of the Deity, and the contracted limits of our understandings. Perhaps the elements are of similar natures, and may be reduced to one, or may be combined so as to form a perfect union; but this is an intricate subject for us to conceive, and we must separately consider their principal parts. Of what various properties is the air composed! with what force it divides and dissolves all kinds of substances, at the same time contrasting their different qualities! The vapours which blend with it are sometimes pernicious, but generally salutary. The foreign particles which load the air, its elasticity, power of rarefying, condensing, and recovering its former state, occasion those meteors which dispel the noxious exhalations, and promote the vegetation of plants. Though the effects of the atmosphere are sometimes tremendous,

yet they are essential to the fertility of the earth. Yet this element, like the other works of God, is concealed beneath an impenetrable mystery: who can solve the question, how the particles of air, which from their subtilty are invisible to us, should prove the medium through which we behold every other object? What is more surprising than the exact equipoise between the external and internal air, on which our existence depends? How surprising that the same element should transmit sound, smell, and light! There is a great resemblance between air and water, which are possessed of equal qualities. The salubrity of the air, the fertility of the earth, the enlivening influence of the fire, would not preserve us without water; it has the power of dilating and separating, of evaporating in the form of clouds and fogs, of penetrating into plants, and oozing out again, through insensible pores, it diffuses its prolific influence over fields and valleys in refreshing dews. It has the property of becoming lighter than air, though a quantity of water is nearly nine times heavier than an equal quantity of air, of resuming its natural weight, of dissolving solid substances, and uniting even with fire. We are less acquainted with the nature of fire than any other element: we can only behold it in its effects, for it is too subtile for sight. Whether the essence of fire consists in motion or the fermentation of inflammable matter, whether it be a simple substance different from all other bodies, which is most probable from experiment, it is certain that it is well worthy our minute attention. Every thing contains some fiery particles, which

appear when they are excited by friction or any other violent motion. There is fire in the air we breathe, the water we drink, the earth which supports us; it unites with every body, penetrates through the smallest pores, is closely united to them, and, however confined, is always felt at last. It dilates the air, and the air gives new vigour to fire; it gives fluidity to water, fecundity to the earth, and health to all animal nature.

The earth, when pure, is distinguished from other bodies, by having neither smell nor taste, by neither dissolving in water or spirits of wine, and being easily bruised between the fingers. Apparently it resembles no other element, yet some naturalists affirm that water is nothing but melted earth, and that earth is only condensed water. According to their system the water continually decreases on the globe, and forms into solid substances, because our earth was formerly a fluid mass, and in more distant ages the whole was water. The elements are indispensible for our privations, and all their various properties are worthy our admiration. How many distinct powers have the Deity communicated to his works! how many celestial and terrestrial agents are employed for the benefit of the universe in general, and the separate parts of which it is composed! What wonderful effects result from the union of the elements! We could with greater ease compute the creatures of God than those numerous principles which actuate them. They all depend on the will of a supreme intelligence; what then must be his power! He has endowed them with an uniform and constant

motion. It is he who maintains the equilibrium of the elements, and thereby perpetually preserves the world!

Dec. 17.

The Sun's influence on the Earth.

This great luminary is the principal cause of all terrestrial scenes, and diffuses its enlivening beams through all the earth: it is composed of the most subtile fire, and penetrates, actuates, attenuates, and separates all bodies; it dissolves solid substances, and rarefies those that are fluid. It is evident that the various phenomena and revolutions of the globe result from the solar influence; and when the rays of the sun fall in a more vertical direction, and for a longer period, as is the case in summer, they must produce more considerable alterations in the atmosphere and earth. When its rays have less refulgence, and appear for a shorter space of time, which happens during the winter months, what revolutions it occasions on the face of nature! What a gradual difference is conspicuous, when from the remotest line the sun approaches towards the equinox, till at length the days and nights are equal. What a new appearance it assumes when that luminous body retrogrades from the tropic of cancer to the equator, till the autumnal equinox returns, and the sun removes from our zenith! The variations we observe in the vegetation of plants, and the internal constitution of bodies, in every climate, and at every season, entirely depend on the distance of this stu

pendous orb: for this reason every season has its peculiar plant, and every climate its peculiar animal. But it is beyond the limits of our contracted understandings to conceive or to describe the various effects which are produced by the influence of the sun. This is the principle of all the revolutions of the globe: and the several degrees of heat and cold chiefly arise from this cause. Chiefly, I say, because the nature of the soil, the proximity of mountains, their height and situation, may partly contribute to the temperature of the air, or other variations in the atmosphere. But it is an indisputable fact, that these necessary causes would not be sufficient of themselves to produce the effects which are evident in many periods and situations, and that they could not be produced without the influence of the sun; therefore it requires but little attention to perceive that it is the cause of all these effects which are daily discovered. Sometimes it rarefies, and sometimes condenses the air; sometimes it occasions fogs and exhalations, and then compresses them together to form them into different meteors.

It is the sun which circulates the sap in trees, that bursts the leaves and blossoms, and matures the fruit: it revives all nature; it dispenses that enlivening warmth which unfolds and perfects all organized bodies: it operates in subterraneous caverns, where it produces metal, and gives life to animated beings: it penetrates into rocks and mountains, and its influence extends to the abyss of the ocean. This alone is a convincing proof of the Creator's power. But if we reflect what numerous

effects are derived from the same instrument, and what various phænomena of nature are produced by its benign power, we should be still more persuaded that nothing but infinite wisdom and boundless power could work such wonders. Would man deserve to be enlightened and revived by the sun, if he did not acknowledge the glorious perfections of the Supreme Being, nor adore him with the profoundest reverence?

Dec. 18.

Winter Rains.

How different are the cold rains from the genial showers which fertilize the earth in summer. Nature seems gloomy with the sad reverse, the sun is veiled beneath the clouded sky, and the distant prospect is concealed from our view. We are surrounded with obscurity, and the impending storm bursts over our heads in torrents of rain: the sky appears an exhaustless reservoir of water, and the rivers overflow their banks, and inundate the country. Yet, however unpleasant the season may appear, it is designed for beneficent purposes. The earth being exhausted by its fecundity, must recover strength, both by rest and moisture. The rain revives the parched and barren land, it penetrates the roots of vegetables, and forms the withered leaves into excellent manure; and these heavy torrents replenish the shallow rivers and exhausted springs. Nature is never idle, though imperceptibly she is still labouring to prepare for another

fruitful year and abundant harvest. When droughts are occasioned by the fervid beams of the sun, the springs which were formed by winter rains overflow the fields and valleys, and spread fresh verdure all around. Thus the wise Creator provides against futurity, and thus apparent evils prove blessings in disguise. The treasures which spring and summer afford us are as countless as the chrystal drops which descend from the clouds: and when short-sighted man murmurs against the dispensations of providence, he has most reason to be thankful. Eternal wisdom is perpetually aiming to fulfil his beneficent designs; and it is for preservation the Deity waters the earth with rain. He knows how to unite his different designs to render them subordinate to each other, and thus produce that universal harmony which subsists through all nature. Thus the animal creation, which subsist for their own and our happiness, require that nourishment which is provided for them by the fruitful showers which fertilize the earth. But here we discover the wisest economy: the vapours which exhale from the earth are collected in the atmosphere, and descend again in gentle showers, heavy torrents, or flakes of snow; even the smallest drops, light fogs, and dews, all contribute to enrich the earth. But in vain would vapours rise, would clouds be formed, if it were not for the winds which disperse them, and convey them to that quarter were the ground requires to be moistened: one country would be deluged with perpetual rains, another would suffer all the horrors of continual drought, and trees, herbs, and corn, would be destroyed, if the clouds were not impelled by the wind

to their appropriate situations. "God says, Let "there be snow on the earth! and it obeys his "will." Let there be rain! and it falls in re- "freshing showers."

The winter rains, the melancholy aspect of the season, are indispensible; so are the gloomy days of our existence, for they may lead to the best ends. Let us not pray for the perpetual sun-shine of prosperity, for adverse scenes must be mingled with them to alienate our hearts from this present world. Let us be resigned when we meet with strokes from the hand of God, convinced that they are wise corrections, bestowed upon us by that wisdom and goodness which is displayed through all his dispensations.

Dec. 19.

The imaginary influence of Planets and fixed Stars.

The amazing distance of these celestial oros, and the little connection between them and our globe, lead us to doubt whether they have any sensible influence upon it; but some superstitious people believe it. What then is this effect? If they mean the lustre of the stars, or the reflected light of the sun by the planets, it is much less considerable than the splendour of the moon; and as the light of the moon has no sensible influence on the atmosphere and earth, the planets and fixed stars must have still less. If it were supposed that the stars emitted any other matter, this assertion would prove fallacious: for if

these emanations were real, they would, when collected in a burning glass, produce some visible alteration on terrestrial bodies, which is confuted by experience. Of course the heavenly bodies have no other influence than the glimmering light they convey to us. Therefore astrologers, whether they are deceived themselves, or intend to deceive others, are worthy of nothing but contempt, when they speak of a beneficent Jupiter, a malevolent Saturn, a warlike Mars, a witty Mercury, and an amorous Venus. The planets, far from producing the effects imputed to them, have no power at all. What shall we say then of Pleiades, which foretels rain? The impetuous Orion, the harbinger of storms; the woe-fraught Hyades, the setting of Arcturus, and the rising of Capricorn, which presages hurricanes? What influence can the constellation Taurus have on the growth of pease and beans, or the Dog-star on the madness of dogs? or what connection can subsist between Scorpio and our harvest? It would be very allowable, if the rising and setting of the constellations were only observed to judge of the proper seasons for the different parts of agriculture, and not the cause of natural things. In antient times the seasons were not denominated by months, but by the rising and setting of the stars in conjunction with the sun, or by their immersion into, and their emersion out of its rays. From hence arises the vulgar opinion, that the different aspects of those stars produced effects which in reality should solely be imputed to the sun. Orion rises in autumn, and sets in winter; which gives rise to the assertion that it presages storms, while this

change is occasioned only by the season. The sun is intensely hot in our zone when the Dog-star rises, but this happens only from the perpendicular direction of our sun. I say our sun, for on the opposite zone, when the Dog-star rises with the sun, the cold is so severe as to freeze animals and rivers, so that the southern nations esteem this constellation as the cause of cold, instead of heat. Thus it is with the Pleiades, which are said to foretel rain; and all the other stars, to which they impute these various effects. If the planetary bodies have no influence on the natural revolutions of our globe, they must have still less on human actions. The state of individuals, or nations, partly depends on natural talents and passions, partly the union of certain moral and natural circumstances. If they had, we should be inclined to disbelieve that the world was governed by an over-ruling providence. Who would inhabit a globe where all its revolutions depend on erring chance, or the influence of the stars?

Let the humiliating science of astrology, which is so destructive to mortal peace, be left to the superstitious; in fact it is only an abuse of astronomy. We place the sure basis of our felicity on the protection of a wise, just, and merciful Being, who directs all human affairs

Dec. 20.

The Polar Star.

One of the most remarkable northern constellations is nearest the arctic pole, and is called the

Lesser Bear: the extremity of its tail is but two degrees from the pole, which has given it the name of the Polar Star. We may easily distinguish it from the neighbouring stars, as it alters its position very little; and though it revolves round the pole, its motion is so gradual, and the circle it describes so very small, that it is scarcely perceptible. As, therefore, it always preserves its situation, it was a sure guide to the mariner, especially before the invention of the compass; and now, when the sky is clear, they may more safely depend on that than on the magnetic needle.

This reflection leads us naturally to adore that divine goodness, which, by the direction of the celestial orbs, has informed us of the times, places, and different points of the sky. An astronomer, though in an unknown country, can judge of his exact situation by the stars, he can tell the exact month, day, or hour, as certainly as if he consulted a watch. If, for example, we observe that the stars rise four minutes sooner every day, we know that this makes two hours every month. Thus the star which we observe at ten o'clock, in any point of the heavens, we shall see on the twentieth of January, at eight o'clock, if we watch it from the same place. The star which at midnight appears over our heads, will a year hence be in the same spot. In this let us acknowledge the universal goodness of Jehovah. How unpleasant would it be for those who are destitute of clocks or geographical charts, if they could not supply them by the observation of the stars. If we consider their situation, we shall esteem these reflections worthy our attention, for our hearts

must be susceptible of the basest sensation if we disregarded the sorrows of our fellow-creatures because we are not participants in them. Let us look with gratitude to their Creator! This is none of the least advantages which result from the stars, yet this alone deserves our admiration and thanksgiving.

DEC. 21.

Effects of Air when confined in Bodies.

How surprising are the effects which proceed from air confined within! Every body knows that water, when congealed, breaks the vessel which contains it. A musket-barrel will burst in severe cold if the musket be hermetically sealed: at first this appears singular, for we know that water is not naturally fluid, but rendered so by the fiery particles which penetrate every part; and when it is deprived of these, it loses its fluidity and motion. It appears then that the frozen particles of water would grow more dense and consequently occupy a smaller space than before; yet it is proved, on the contrary, that they certainly dilate, else why should they burst the vessels they are in; besides, how could the ice swim at top if it did not increase in size, and were not lighter than water? What then produces this effect? The interior air. The cold has no positive quality, nor can it penetrate into any bodies, therefore it cannot arise from thence; and it is equally true that heat is not the occasion of the phænomenon. The air cannot in

sinuate itself into glass or metal vessels which are hermetically sealed, and yet ice is sometimes formed in them. We must therefore impute it to the air which the water contains. If we observe the water just beginning to freeze, the first coat is scarcely formed when a number of little bubbles rise upon its surface. The upper crust often braeks in the middle, then the water rushes out of the opening, flies against the vessel, and congeals while running down its sides. This gives the water a convex appearance in the middle.

These are the effects which result from confined air, which could not be produced, or at least but in a very small degree, if all possible air had been extracted before the water had frozen. Thus we may explain many surprising phænomena. The sap which circulates through plants thickens in autumn and winter, and turns to ice during severe cold; this must swell its size, and burst some of the fibres and stalks of plants. It is evident that when spring returns, and the sap becomes liquid, it can no more circulate than the blood of an animal which has received an incision in the vein. Thus the nutritive juices no longer flow through the vessels, and the vegetable dies. We may however remark, that the cold which is prejudicial to plants, is in some respects beneficial to the earth. The ground which was plowed before winter, is in a better state to receive the autumnal rains, if frosty weather succeed, the particles of earth dilate and separate, and spring completes the preparation of the earth for the enlivening influence of the summer sun.

Enough has been already said to convince us of the expansive property of air, which causes so many beneficial consequences on our terrestrial globe. The condensing and rarefying powers produce the most considerable revolutions in our world. It is very seldom that the force of this fluid becomes pernicious, and then its advantages greatly overbalance its evils. At the same time it must be confessed, that there are various difficulties still remaining to be solved in this and many other of the works of nature. Our present knowledge of the property of air is in a great measure reduced to probable conjectures, which will be elucidated in future, or confuted by our decendants. With what humility should we investigate the works of God? With a firm persuasion of the weakness of our understandings, and the uncertainty of our systems and conceptions. Presumption is inexcusable with respect to any science, but it is absolutely foolish when we speak of the knowledge of nature.

DEC 22.

Music.

FROM music we derive the purest pleasures we enjoy. It charms the ear, soothes the passions, touches the heart, and influences the temper and disposition; its harmonious accents calm our griefs to silence, revive our spirits, and ennoble the sentiments. Such a pleasing and useful science is worthy our attention, and should prove another motive to glorify our Creator. From whence proceed then

the impression which strikes the ear? It is the effect of air, which receives an undulating motion, and strikes our auditory nerves in various ways. When a tight cord is pulled it alters its form; for its elasticity inclines it to return to its former place, and also to extend beyond it to another side: thus it continues vibrating backward and forward till it recovers its previous position. These vibrations communicating with the air, are carried to other contiguous bodies; for example, when we play on an organ, if a lute be near, its strings are immediately put in motion. But what occasions the difference of sounds? Why are some sharp, and others flat? It depends on the quantity of air which is agitated, for both sharp and flat sounds are alternately feeble or loud. Neither can it arise from the swiftness of the undulating by which the sound is conveyed to the air, for a sharp tone is not quicker than a flat one. The difference proceeds from the rapid fluttering of the air; a sonorous body makes a sharp tone when the vibrations of its parts are quicker, and a flat one when they are slower. But why is the union of sounds sometimes harmonious, whilst at others it is harsh and discordant? Harmony consists in the union of similar sounds, produced at the same instant, while discordance arises from the contrary cause. If we could not distinguish melodious from disagreeable sounds, what peculiar pleasure should we derive from the former! Let us then bless that God who has enabled us to receive the various impressions which are imparted by sound, and to associate certain ideas with bodily sensations. What various sources of delight he is con

tinually bestowing! Oh! let us express our thanks by glorifying his name, and employ the melodious strain of music to elevate our exulting hearts with gratitude to our great Benefactor

Dec. 23.

A comparison between Men and Animals.

In our present comparison between mankind and the brute creation, we shall discover a great similarity, and sometimes a superiority on their side, though principally in the human race. Like them, we have organized bodies produced by propagation and birth, and sustained by food; we have animal spirits, are enabled to perform our various allotted functions, to exercise our members, senses, imagination, and memory; we are susceptible of pleasure and pain, desires, and aversions. Like them, we are prompted to preserve our lives, and propagate our species: are obnoxious to those external accidents which are naturally occasioned by the construction of the body, and the universal link which subsists between all created things. They have a larger share of sensual gratification, they require neither the garments, defence, and inconveniences, which are absolutely indispensible to man; nor are they obliged to invent or exercise the necessary arts for these purposes. They possess at their birth every thing they need, and by implicitly following that instinct which is implanted in their natures they obtain the requisites for happiness. It never deceives

them, but is a constant guide: they are content when their appetites are satisfied, and never indulge to excess; and whilst they taste the present joy, they are unmindful of the future. They foresee not approaching death, and therefore this is never a cause of distress. In these respects they are superior to man, who must reflect, labour, and learn, before he can attain the necessaries of life, or outgrow the state of childhood. His instinctive powers are but uncertain guides, or would often plunge him into the abyss of misery. It is reason makes the grand distinction between man and the brute: it gives the former an advantage the latter can never attain. It not only bestows every comfort, but increases and ennobles the pleasures of sense, and renders even the desires of man subservient to them. He is capable of pleasures that are unknown to other animals; pleasures which are derived from science, wisdom, virtue, and religion, and which infinitely exceed the gratifications we received through the medium of the senses; because, far from diminishing the real perfection of man, they add lustre to it, and never forsake him even when sickness or old age deaden the senses to all animal enjoyments; and finally, because they render him a more perfect image of the Deity, while the indulgence of sensual pleasure degrades him to the resemblance of a brute. The desires, and consequently the pleasures of animals, are confined within a very narrow sphere, while man has an infinite variety. He renders every thing subservient to his happiness, and makes a rapid progress in the path of perfection by additional discoveries and the

acquisition of knowledge while brutes neither invent nor improve, nor extend the bounds of their limited capacities. The distinguishing mark of a rational being is to improve that gift of heaven, in ennobling the gratification of the sense, and adding new relish to intellectual pleasure, that we may daily improve in wisdom and virtue. This is the great end for which we were created! Let us be constantly assiduous in the fulfilment of it, for we can only be happy in proportion as we follow the dictates of reason.

Dec. 24.

Calculation relative to the Resurrection.

At the great day of resurrection, with what multitudes of human creatures will the spot where this city is built be covered! What incredible numbers will the whole earth contain! prodigious, but not innumerable; for the great Judge has inscribed the name of every individual in his book, and none shall escape his penetrating eye, for he shall summon every mortal before his dread tribunal! Supposing Germany began to be peopled 500 years after the universal deluge, therefore within about 4,500 years, and that from the foundation of our city to the present period, even to the day of judgment (if it were to happen this year), there had been annually interred about 200 people, the number of dead would amount to 900,000. If then one single city would furnish this number, what would all Germany produce? In stating its number of inhabitants to be

about 24 millions, we cannot reckon our city to be more than the three-thousandth part of the whole, and we may infer from the foregoing calculation that Germany contains 2100 millions. This is an astonishing number; but trifling in comparison with what the whole earth contains, which at present is computed at more than a 1000 millions. If we fix it at this number, the total of those who have died during the above-mentioned space must amount to 87,500 millions. If to the antedeluvians, and those who succeeded them, we add those who lived during the space of 500 years, which may be certainly reckoned a quarter of the preceding, the total will then amount to 109,375 millions; and if we include the persons who may be living when that awful period arrives, and fix it, as before, at 1000 millions, it will then increase it to 110,375 millions.

Let us take a view of this prodigious multitude before the Judge of the World. How great must be that intelligence which can survey the mind of every individual, and penetrate every thought, word, and action! who will be perfectly acquainted with their birth, their term of earthly existence, and the circumstances of their death! to unite the separate atoms, though their bodies have been crumbled to ashes, and passed through various transformations! What an almighty work to collect, to purify, to ennoble, and prepare them for a glorious immortality.

DEC. 25.

Thoughts on Christmas-Day.

WHAT grateful sentiments this day inspires, on which we hail the birth of our Redeemer! But it is mingled with surprise when we reflect on the circumstance which attended this grand event. I behold the Son of man in the most humiliating condition; and this Son of man is my God. That mighty, that invisible power, at whose word this universe was formed, and will fade away, clothed with humanity, weak, and destitute! How amazing is this union: the King of kings, who is adored by prostrate angels, appears under the form of a servant! A feeble infant lying in a manger! What astonishing humiliation! Human nature so degraded, so corrupted, rises with Jesus on a throne of eternal glory! What a reverse! How can I conceive his infinite mercy, or rather does not my astonishment increase when I reflect on my own unworthiness, and the majesty of my Saviour? It was a love which exceeded all my merits, beyond my utmost conceptions, and can only be returned by silent adoration. But though my sense of his beneficence is so great, I have an equal joy, an equal confidence in God's goodness. In this union of God and man, I see the joyful emblem of the new covenant. Faithful to his word, the Almighty has sent his Son into the world, that through him we may obtain eternal life, and the glorious assurance that all his promises will be thus fulfilled. Christ would never have assumed our nature had he not

resolved to heal our infirmities, to forgive our faults, and restore polluted nature to primeval innocence. Should we not, therefore, on this solemn day resign every power to pious gratitude, though our noblest praises will be nothing in comparison with his inestimable love? Let us exert our utmost endeavours, and trust he will regard our imperfect, yet sincere thanksgivings with a favourable eye. With such sentiments as these we should celebrate this holy festival. Let not our admiration and our hope be the effect of ignorance or of blind persuasion for if it be derived from real faith, it will fill our hearts with heavenly consolation, and support us under all the various vicissitudes of this uncertain state.

DEC. 26.

The Place of our Saviour's Nativity.

AT first it appears of little importance to know the place where our Saviour was born, for he would still be our Redeemer whatever circumstances attended his mortal life. But since the Almighty predicted the place of his nativity, it was necessary that this prediction should be fulfilled, and it was one convincing argument of the truth of his mission. We are indifferent with respect to the place we inhabit, if we be possessed of happiness. The poorest spot of earth contains happier beings than some who reside in opulent cities. The goodness of God is displayed through every part of this terrestrial globe, and wherever our lot is fixed, we may

always derive the sweetest satisfaction from a peaceful conscience. That place is preferable for individuals where they are possessed of health, and the opportunity of blessing others, and in a nation where wisdom and virtue are predominant; for a state decays in proportion to the decline of virtue and religion. When the youth beholds the venerated spot where he first hailed the dawn of returning spring, and felt his bosom glow with the liveliest emotions of gratitude and joy towards his Creator; when the virtuous pair recognize the scene where first they met; or two friends that place where they gave the noblest proofs of disinterested affection; when any one revisits that village where he beheld, or himself performed, some remarkable act of justice or benevolence, does it not excite the softest sensation in the soul? Thus Bethlehem, though small, was a venerable place, for it contained many pious inhabitants. Here Jacob staid to erect a monument for his beloved Rachel; here the worthy Naomi and modest Ruth evinced their faith and patience; and here the generous Boaz held his vast possessions. Bethlehem was the abode of the humble Jesse, the happy father of so many sons, whose youngest born rose from the state of a shepherd to ascend the throne of Israel. It was there the prince Zerubbabel was born, who descended from David, and was a type of the divine Shepherd, who was to govern his people Israel; and lastly the Son of God appeared there for our redemption.

Thus do inconsiderable places produce great characters, who prove benefactors to mankind; and an humble village yields a man, who, by his wisdom,

uprightness, and intrepidity, becomes a blessing to kingdoms. Piety would make a more rapid progress, if it were our constant study to prove the advantage of morality and religion. If our cities furnished more examples of virtue, their influence would extend to the country, and in the smallest hamlets we should find those families who, like Joseph and Mary, distinguished themselves by their piety, and obtained respect in the midst of indigence. Then would the Deity shower down his blessings on this pious nation, which would grow perfect in holiness. He who is conversant with great cities, and who has witnessed the crimes with which they abound, will have reason to rejoice if at length he finds a peaceful cottage, where, surrounded by the virtuous, he may devote himself to the service of God and his creatures, and thus enjoy that true content which springs from a peace of mind. He will not regret those magnificent, extensive, and opulent cities, where luxury insnares, where vice presides, and where the duties to God and our neighbour are neglected. He will surely prefer the obscure retirement, where free from the stings of remorse, he may taste substantial happiness.

DEC. 27.

Cares of Providence towards Mankind from their Birth.

How various are our wants from the first moment of our existence! We are brought into the

world with difficulty, and should soon be bereft of life if it were not for the kind protection of our friends, and the previous preparations of our birth. I should rather say, we have been preserved by that paternal care which watched over the imperfect embryo, and extended his mercies to the present moment. At that period he laid the basis for our future happiness. We are weak and fragile, unacquainted with our future destiny; but this was known to God. He foresaw the various events which would attend our early state, and planned his beneficent schemes so as to conduce to our welfare, and determine on the means he would employ to procure us the blessings he designed. From our entrance into the world those causes existed which were to influence our future felicity, and they began to act conformably to his views. How much our happiness or misery depend on the ideas and situation of our parents, our previous education, examples, and opportunities of improving our various talents! It is God, whose prevailing power dispensed our blessings, and the same mercy directs our adverse scenes. He knew the advantages of sorrow, he knew its sources and its consequences. These are concealed from us, but by degrees they unfold, and convince us in the end, that adversity is essential to our real happiness. But they would not produce such salutary effects without the concurrence of many secret and remote causes. This reflection should excite tranquility in our bosoms, since we are protected by an invisible Being; a Being of infinite wisdom, goodness, and omnipotence, who guarded us in our mother's womb, who has im-

mutably appointed our condition in life, and term of existence, which no human power can alter: and who has ordained our eternal happiness. How unshaken must be that confidence which rests on the firm foundation of such a hope!

Dec. 28.

Term of Human Life.

God has appointed the hour of our dissolution, as he fixed the moment of our birth. But the term of our existence does not depend on inevitable fate, for there is not such a thing in the world. The events of our life might occur sooner or later, or even not at all; and the man who dies to-day, might have quitted this world at an earlier or remoter period. God does not reckon our days by an absolute decree, which is independent of circumstances. He is infinitely wise, and always acts upon some worthy motive: for just reasons, therefore, he sees it expedient that every mortal should die at the particular time which he determines. But the term of our existence is immutably fixed, though it be not governed by the laws of fate. When the period of dissolution arrives, there is some cause which infallibly occasions it, unless prevented by a superior power. One dies of a mortal disease, another by some unforeseen accident; some are destroyed by fire, others by water. God foresees these various causes, nor remains an idle spectator of their effect; he examines them with care, compares them with his designs, and sees whether he approves them or

not. If he wills them, he determines accordingly, and makes a divine decree, by virtue of which the mortal dies at such a time, or by such an accident. As from all eternity the Deity was acquainted with the reasons which now actuate him, he then formed the same judgment as at present, and is irrevocably fixed. But it is possible, however, that they may not meet his approbation; and if this be the case, at least he determines to permit them. And if he thus resolves what he had previously decreed, we should die at the period when these causes existed. He was disposed to grant us a longer life, and does not approve the causes which terminate it, but it is not consistent with his wisdom to oppose them. He perceives the universe at large, and is induced to permit our death at such a time, though he does not approve the causes, manner, or circumstances which attend it. His wisdom directs our death to useful purposes, or else he foresees that a longer life would be neither beneficial to ourselves or the world; or possibly it would require a new combination of things, inconsistent with his general plan, to prolong it. In short, though the Deity may disapprove of the occasion, he has always the wisest reasons for permitting the event which is consequent upon it.

These reflections are calculated to inspire us with Christian fortitude at the approach of death. It is the uncertainty of its arrival which renders it so terrific. If we were previously informed when or how we should die, it would in a great measure dissipate our fear, and arm us with fortitude. No thing can more effectually encourage the mind than

the thought that we are protected by an over-ruling providence, who prolongs or shortens our days as he sees best, both for time and for eternity. Persuaded of this consolatory truth, we may wait for death with pious tranquillity; and as its arrival is uncertain, be in constant preparation for it. We are ignorant indeed of the circumstances which may attend it, but it is enough to know that all our concerns are under the guardian care of a merciful Being. Let this sustain us through an earthly pilgrimage; and, free from anxious solicitude, let us submit to the dispensations of providence, nor shrink from dangers to which we are called by the voice of duty.

DEC. 29.

Instability of earthly things.

ALL nature is obnoxious to change; frail and uncertain, it does not long retain the same appearance. The most solid bodies are not sufficiently compact to preserve them from decay and dissolution; and each particle of matter insensibly varies its formation.

The human frame undergoes numerous transformations; it annually loses some portion of itself and acquires new parts, extracted from mineral, vegetable, and animal substances. All earthly bodies alternately diminish and increase, but this change is more rapid and perceptible in some than in others. The celestial orbs preserve the aspect which they first assumed at creation, and perhaps

hey are the most invariable of all bodies; yet those vho have minutely observed them, perceive that ome stars have vanished, and that spots have been emarked on the sun's disk, which often change their situation. Though its light is never extinguished, its beams are concealed by fogs, clouds, and even by internal revolutions. The immeasurable distance which is placed between our earth and this celestial luminary prevents our perceiving many other external, as well as internal variations, which a greater proximity of situation would discover to us. And if we were more struck with the instability of earthly things, it is because they are within our view. And, oh! how frail they are! Every object continues to appear like itself, yet in reality how different! They daily assume new forms, some improving, while others decrease and perish. This year, which in two days will be concluded, affords abundant evidence of this assertion, In the limited circle of every individual, how many revolutions have taken place! Several of our intimate friends are no more! The opulent have sunk to indigence, or at least to mediocrity: we ourselves are altered. Have not our health and activity diminished, and are not these alarming presages of that final revolution which will be produced by death? How many changes may arise in our situation during the two remaining days of this year! we may become poor and sick, be forsaken by our friends, and even die. Such reflections would overwhelm us with despair, if it were not for the solace and support of religion: this leads us to that Being whose nature is immutable. and whose

mercy is eternal. Confiding in his unchangeable goodness, let us submit with resignation to all the vicissitudes of this transitory state.

DEC. 30.

Calculation of Human Life.

THE approaching close of the year leads me to reflections, which, however important, are too often banished from my mind. To give me a deeper impression of the shortness of life, I will examine how I have improved my past days, though I fear it will be a subject of regret and humiliation. I first recal my years of childhood; how many hours have been employed merely in the gratification of my bodily appetites! How many more trifling occupations of no service to the mind! Thus, when I take a retrospective glance on these years, I discover a multitude of days lost to the interests of my immortal soul, which inhabits this tenement of clay. After these deductions, what portion will remain which I have improved for my spiritual life! It is evident, that out of 365 days I can scarcely reckon fifty which have been effectual in promoting my eternal happiness; and how much do I lose of these remnants of time by my own folly and weakness! How many days have been sacrificed to vice, and even of those which have been granted to reflection; How many devoted to the world, and the pursuits

or visionary pleasure! Perhaps they have been profaned by impurity, jealously, slander, and other vices which contaminate the heart, and evince a soul destitute of veneration for God, and charity to our neighbour. Even since the grace of God has enabled me to amend my conduct, and inspired me with a wish to walk in the paths of holiness, how many hours that will never return have been devoted to thoughtless indifference, anxious doubts, the guilty emotions of passion, pride, and all those frailties to which the weakness of reason and the evil propensities of human nature constantly expose us! In the last place, how swiftly will the small space of time that yet remains glide on? A year passes away unperceived, yet a year is of the utmost consequence to a being whose life may be computed by hours. When we reflect how small a portion of it has been employed conformably to the grand ends for which we were created, well may we sigh to recal the hours we have wasted or devoted to improper pursuits; but vain would be the wish. The year, with every action, evil or commendable, that marked its progress, is lost, for ever lost, in the fathomless abyss of eternity! Pardon then, O most merciful Father, the errors we have committed! Grant us the beamings of thy grace in the solemn hour of death, in the awful day of judgment, and throughout the countless ages of eternity!

Dec. 31.

A Hymn of thanksgiving at the Close of the Year.

God of eternity, I raise
A grateful song of rapturous praise,
To celebrate thy name!
Thou through this rolling year hast shed
Thy numerous blessings on my head,
And spar'd this mortal frame!

Almighty Being! at thy throne,
Prostrate, thy bounteous gifts I own,
And thy protecting hand;
Thou art eternal, fixed, and just!
We are but frail, and turn to dust
At thy supreme command.

Thy sacred word is ever sure,
To distant ages shall endure,
And prove thy promise true;
Each morn the sun's resplendent ray
Pours blessings on the rising day,
And sheds prolific dew.

When with tormenting cares opprest,
Thy influence soothed my aching breast,
And calm'd the swelling grief,
The sovereign balm, with healing art,
Assuaged the anguish of the smart,
And gave my woes relief.

Then while existence still remains,
I'll praise thee in devoutest strains,
And every care resign.
Pardon, O God! my numerous crimes,
Erase the sins of former times,
And make me wholly thine!

Teach me to do thy holy will,
Teach me to love and please thee still,
Through every fleeting hour.
My cheerful heart in hope relies
On him who all my wants supplies,
And guards me by his pow'r!

Give me fresh zeal to speak thy name,
Thy goodness all thy works proclaim,
And mark the path to heaven!
O may my now attentive ear
The voice of soft instruction hear,
By whispering conscience given!

Let thy kind Spirit from above,
Plant in my heart the seeds of love,
Of pure and genuine kind;
While wand'ring in the present state,
A future may my hopes elate,
Of pleasures more refined!

This world, with all its glittering toys,
Its fleeting visionary joys,
But mocks the ravish'd sight:
To nobler pleasures I aspire,
Where angels tune the golden lyre,
And beam effulgent light.

Teach me the moments to redeem,
Each moment trifling, though it seem,
  Conveys me to the tomb !
Uphold me with thy gracious hand,
Till I shall reach that blessed land,
  Where joys immortal bloom.

There shall I rest from all my woe,
Where streams of sacred pleasure flow,
  And golden seraph's vie
With notes harmonious to adore
That wise, almighty, gracious powe
  Whose throne adorns the sky

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